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ABSTRACT

This curriculum guide, consisting of materials for use in providing an industrial arts instructional program, focuses on competencies related to life coping skills, technology, free enterprise, and career opportunities through industrial arts. Addressed in the course are the following topics: career planning and development; decision making; communication; drafting, graphic arts, and electronics; principles of economics, business, and free enterprise; manufacturing a product through occupational role playing in a simulated corporation; exploring construction types, plans, occupational roles, and responsibilities; and principles, applications, and careers associated with power, transportation, and energy. The guide includes an introduction and statement of purpose, a description of the industrial arts program, a list of student options, an outline of the general curriculum structure, course objectives, a course outline and time allocations, unit performance objectives and evaluation criteria, detailed unit plans, and a reference and resource list. (MN)

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TECHNOLOGY, FREE ENTERPRISE, AND CAREERS

THROUGH

INDUSTRIAL ARTS

A COMPETENCY BASED CURRICULUM GUIDE
DESIGNED TO MEET HIGH SCHOOL
GRADUATION REQUIREMENTS

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JULY 1983

Developed by Berry College
Under Contract with the State Education Department

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SECTION I

INTRODUCTION AND PURPOSE

This guide is designed to improve instruction in industrial arts programs in Georgia by assisting the individual teacher in the selection of student performance goals, teaching methods, student learning activities and evaluation techniques. Teachers who follow the main spirit of suggestions in this guide will be providing an instructional program which achieves or reinforces required graduation competencies related to the life role skills of the learner, the individual, the citizen, the consumer, and the producer. The experiences related to career planning and economics/business/free enterprise were designed to justify the awarding of 1/3 Carnegie units (meeting graduation requirements) in each of those areas if adopted by the local school system. Students who complete the entire course should be awarded one Carnegie unit in industrial arts (with adoption by local systems). Career planning and economics are presented as separate instructional units and then reviewed and reinforced in all of the other units of the course.

DEFINITION OF TERMS

1. Competency Based Education (C.B.E.)

   Competency Based Education is an instructional management process which organizes instruction in support of specific, measured outcomes. Georgia's CBE instructional process can serve as a method of organizing the teaching-learning processes for sequentially measured behaviors and outcomes in industrial arts.

2. Life Coping Skills

   Those skills which are necessary to address effectively and efficiently the decisions and opportunities presented to individuals in our technical and urbanized free society. Life roles pertinent to this guide include those of the learner, individual, citizen, consumer and producer. These roles are explicitly defined in Section V.

3. Competency

   The demonstrated ability and/or skill to apply knowledge, understanding, or skills assumed to contribute to success in life.

4. Course Description or Catalog Description

   A concise statement explaining course content, student prerequisites, grade level, and other pertinent information normally presented in a schools official listing of courses.

5. Course Competency Goals

   Broad statements of competencies, stated in behaviorial terms, derived from the traditional goals of industrial arts. These goals provide direction for a course. The achievement of these goals will help the student to cope with life role situations.

6. Unit

   A major subdivison of a course including content, method, activities, and evaluation.

7. Unit Performance Objectives

   The behavior students are expected to demonstrate at the conclusion of each unit; the actual or simulated contexts/conditions under which the behavior must be performed; and, the level of competence or proficiency to which such behavior must be demonstrated.

DEFINITION OF TERMS (CONT.)

8. Evaluation Instrument

   Tests, rating scales or other record of the achievement of the unit performance objectives by each student.

9. Teaching Methods

   A brief statement of strategies and techniques used to present instruction.

10. Student Activities

    Student learning experiences leading to the achievement of a given objective. (What students will do, rather than what teachers will do.)

11. Cross Reference

    A system of abbreviation and numbers used to relate course competencies, unit performance objectives, and state requirements (life role skills) to activities within this Competency Based Education (CBE) Handbook.

SECTION II

DESCRIPTION OF THE INDUSTRIAL ARTS PROGRAM

The State Education Department position paper for industrial arts describes the industrial arts program as follows:

> Industrial arts education is that phase of education that is involved with acquainting students in grades K-12 with the technological and industrial society in which we live. Industrial arts has vocational as well as general education goals. Industrial arts programs are designed to help each student, regardless of sex, to understand the technology, organizational structure, special problems and critical contributions of the industrially orientated free enterprise system to the larger American society. In addition, it helps them to identify and develop their own vocational and avocational interests and capabilities. This is accomplished through carefully planned instruction with specifically designed tools, materials, equipment and facilities and through industrial arts youth organizations. The students are required to master cognitive content, manipulate tools and materials, create solutions to practical problems, simulate processes and behavior patterns common to a wide variety of occupational roles, practice and social skills of cooperation, dependability, responsibility and leadership and develop desirable habits and attitudes with respect to group and individual safety.
>
> The industrial arts program stresses for each student the following: assists in developing an understanding of industry; assists in making informed and meaningful occupational choices; provides knowledge and skills for entry into advanced trade and industrial or technical courses; assists in discovering and developing individual talents, assists in developing technical problem solving and consumer skills, assists in developing basic skills in the safe use of common tools and machines; and provides an opportunity to apply knowledge learned in other subjects to actual life-like situations in the industrial arts laboratory.

Long established industrial arts subject matter content and teaching methods are very compatible with the delivery of this course. This course differs from other good general industrial arts courses only in the amount of time allocated to specific topics and the major emphasis on economics/business/free enterprise and career planning.

Below is a suggested catalog or syllabus description of the course.

I.A. _____ General Technology, Career Planning and Free Enterprise Through Industrial Arts

Principles, processes, economic concepts and organizations, career classifications, and career planning related to the broad technological areas of communications, manufacturing, construction and transportation/energy control will be studied. Role playing in simulated situations, reading, written and oral reports, group and individual experiments and projects, and actual performance of manipulative tasks as instructed will all be required. The course is designed to meet graduation requirements with regard to Career Planning and Business/Economics/ Free Enterprise when taken for a full year.

SECTION III

STUDENT OPTIONS

This course should be made available to all high school students. Most students should elect the course early in their high school program to assist them in making informed and meaningful career and educational decisions regarding the rest of their formal schooling.

Students should be able to use the course as a full Carnegie unit toward graduation, 1/3 Career Planning, 1/3 Business/Economics/ Free Enterprise, and 1/3 industrial arts, or one full unit of industrial arts elective.

SECTION IV

GENERAL CURRICULUM STRUCTURE/ORGANIZATION

The general organization of this industrial arts course is presented in Figure I. This course is divided into seven major units each taking the number of weeks of instruction indicated.

SUMMARY OF TIME ALLOCATIONS FOR COURSE UNITS

WEEK 1

INTRODUCTION
ADMINISTRATION PROCEDURE

WEEKS 2,3,4,5

CAREER PLANNING AND DEVELOPMENT
PRINCIPLES, DECISION MAKING

WEEKS 6,7,8,9,10,11,12,13,14

COMMUNICATION
EXPLORING DRAFTING, GRAPHIC ARTS, ELECTRONICS

WEEKS 15,16,17,18

PRINCIPLES OF ECONOMICS/BUSINESS/FREE ENTERPRISE

WEEKS 19,20,21,22,23,24,25,26

MANUFACTURING
A PRODUCT THROUGH OCCUPATIONAL ROLE PLAYING
IN A SIMULATED CORPORATION

WEEKS 27,28,29,30,31

EXPLORATION OF CONSTRUCTION
TYPES, PLANS, OCCUPATIONAL ROLES AND RESPONSIBILITIES

WEEKS 32,33,34,35,36

POWER/TRANSPORTATION/ENERGY
PRINCIPLES, APPLICATIONS, CAREERS, AND ALTERNATE
ENERGY SOURCES

FIGURE I

SECTION V

COURSE OBJECTIVES

Realization of the broad course goals for this industrial arts course should logically lead to achievement or reinforcement of the life role coping skills identified by the State Education Department or the local school system. For purposes of future reference, a typical listing of validated competencies for the roles of learner, individual, citizen, consumer, and producer is presented in Table I. Associated with each major competency and sub-competency statement is an alpha-numerical code which will be used in other tables in the remainder of this guide.

The broad goals of this course are presented in Table II. Table II also shows the direct relationship between each course goal and the life role competencies from Table I which are reinforced by achievement of the course goal.

TABLE I

BASIC COMPETENCIES OR LIFE COPING SKILLS CLASSIFIED AND CODED BY LIFE ROLES

CODE	LIFE ROLE	COMPETENCY OR DESCRIPTION
LRN	Learner	*Each graduate should demonstrate competence in the areas of reading, writing, mathematics, speaking and listening and problem solving. Performance will be demonstrated by students using those materials which are used in typical academic, employment and everyday tasks. These may include newspapers, magazines, personal budgets, tax and employment forms, textbooks, business and personal letters and other materials requiring the application of basic learning skills.
LRN 1	Learner	*Reading - A student will demonstrate competence by his or her ability to read, understand, interpret and use written materials in the context of academic problems, everyday tasks and employment activities. Indicators of reading competence include such skills as identifying main ideas and details, interpreting literal and figurative language and using reference resources.

Section V
Course Objectives (Continued - Table I)

CODE	LIFE ROLE	COMPETENCY OR DESCRIPTION
LRN 2	Learner	*Writing - A student will demonstrate competency by his or her ability to select, organize and compose written material in the context of academic problems, everyday tasks and employment activities. Indicators of writing include such skills as composing sentences, organizing information and writing paragraphs.
LRN 3	Learner	*Mathematics - A student will demonstrate competence by his or her ability to understand and employ basic mathematical concepts and operations in the context of academic problems, everyday tasks and employment activities. Indicators of skills in mathematics include translating numbers, computing percentages and applying arithmetic operations.
LRN 4	Learner	*Speaking and Listening - A student will demonstrate competence by his or her ability to receive and transmit oral and aural communication in the context of academic problems, everyday tasks and employment activities. Indicators of speaking and listening may include interpreting aural communications, composing oral directions and questions and using formal and informal speaking styles.
LRN 5	Learner	*Problem-Solving - A student will demonstrate competence by his or her ability to evaluate, analyze and draw conclusions from situations presented in the context of academic problems, everyday tasks and employment activities. Indicators of problem solving may include interpreting a variety of data, inferring cause and effect and applying logical reasoning to the identification and solution of problems.

CODE	LIFE ROLE	COMPETENCY OR DESCRIPTION
IND	Individual	**Each graduate should have the skills and understandings necessary to improve both physical and mental health, to use leisure time in a profitable and fulfilling manner and to establish a personal family role which is mutually beneficial to the individual and to members of the family.
IND 1	Individual	**Health and Safety - A student will demonstrate competency by his or her ability to recognize and practice basic health principles involved in developing and maintaining physical and mental health and to demonstrate preventive and emergency actions for health and safety. Indicators may include identifying physical and mental health problems; describing effective physical and mental health maintenance; identifying community health care services and demonstrating safety and emergency practices.
IND 2	Individual	**Leisure Time Activities - A student will demonstrate competency by his or her knowledge, appreciation and use of the cultural arts and humanities, and of avocational and recreational activities. Indicators may include identifying and participating in activities related to the arts, sports and recreation, hobbies, and volunteer work as means of maintaining physical and mental well-being.
IND 3	Individual	**Family and Community Living - A student will demonstrate competency by his or her ability to develop sound interpersonal relationships with persons inside and outside the family and the ability to define personal responsbilities within these relationships. Indicators may include effective use of skills that enhance interpersonal relationships, knowledge of family planning, parental responsibilities and available community resources.

CODE	LIFE ROLE	COMPETENCY OR DESCRIPTION
CIT	Citizen	**Each graduate should have the skills and understandings needed to function as a responsible member of society, using and contributing to society in an appropriate manner and interacting with the environment in a responsible way.
CIT 1	Citizen	**American Political and Economic Systems- A student will demonstrate competence by his or her knowledge of the basic structure and function of the American system of government and the American economic system including interrelationships of the global community. Indicators may include identifying and describing the structure and functions of the three branches of government and their interrelationships at the local, state and national levels; identifying the characteristics of the American economic system, and explaining interrelationships of the global community.
CIT 2	Citizen	**Citizen Rights and Responsibilities - A student will demonstrate competence by his or her ability to identify and describe rights and responsibilities of American citizens. Indicators may include identifying personal rights and responsibilities under the law and Constitution; and describing current societal and environmental problems and the individual's role in solving these problems.
CIT 3	Citizen	**Citizen Participation - A student will demonstrate competence by his or her knowledge of the skills necessary to participate in the political and social arenas. Indicators may include analyzing American political and civic behavior and describing the citizen's role in the decision-making processes of this system.

CODE	LIFE ROLE	COMPETENCY OR DESCRIPTION
CON	Consumer	**Each student should have the skills and understandings needed to function as an informed consumer and to use available resources in an efficient and beneficial manner.
CON 1	Consumer	**Personal Resource Management - A student will demonstrate competence by his or her ability to plan and manage personal and financial resources through effective budgeting and use of these resources. Indicators may include developing a plan for money management, describing various forms of credit and comparing goods and services on a cost/quality basis.
CON 2	Consumer	**Consumer Rights and Responsibilities - A student will demonstrate competence by his or her knowledge of legal rights and responsibilities of consumers and community resources that provide consumer assistance. Indicators may include recognizing consumer problems, identifying laws and agencies which aid the consumer and describing procedures for utilizing these resources.
PRO	Producer	**Each graduate should have the skills and knowledge necessary to select and pursue a career reflecting personal interests and abilities. Each graduate should also have the skills needed to pursue a new career should situations arise which dictate career changes.
PRO 1	Producer	**Career Decision Making - A student will demonstrate competence by his or her ability to evaluate career options as they reflect personal interests, aspirations and abilities. Indicators may include relating personal interests and abilities to career options, identifying sources of career information, utilizing an effective method of goal setting and decision making, and planning educational experiences related to tentative career choices.

CODE	LIFE ROLE	COMPETENCY OR DESCRIPTION
PRO 2	Producer	**Job Acquisition and Retention - A student will demonstrate competency by his or her skills in locating and making application for employment and knowledge of behaviors and attitudes necessary to maintain employment. Indicators may include completing employment documents, identifying sources of information and assistance about job availability, demonstrating interview techniques and identifying attitudes and behaviors necessary for maintaining employment.
PRO 3	Producer	**Career Mobility - A student will demonstrate competency by his or her ability to anticipate and prepare for job advancement or career change. Indicators may include identifying behaviors and attitudes which are required for job advancement, describing conditions or events which may necessitate career change and analyzing personal skills in anticipating and preparing for such a change.

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*Competency description quoted from Administrative Manual for Georgia High Schools, 1981.

**Competency description quoted from state paper "Validated Competencies and Performance Objectives: Individual - Citizen - Consumer - Producer," May, 1981.

TABLE II

BROAD COURSE COMPETENCY GOALS RELATED TO LIFE ROLE COPING SKILLS

LIFE ROLE COMPETENCY	COURSE COMPETENCY GOALS
LRN 1,2,3,4 IND 1 CIT 1,2,3 CON 1 PRO 1	1. Upon completion of the course students will be able to describe the American free enterprise system, answer questions regarding its role and contribution to the society, define and utilize basic economic terms, concepts and relationships, and be better prepared to fulfill adult economic and decision making roles.
LRN 1,2,3,4 IND 1 CIT 1,2,3 CON 1 PRO 1	2. Upon completion of the course students will have the ability to understand, use or apply many of the tools, materials and processes of industry as they relate to the free enterprise system.
LRN 1,2,3,4,5 IND 1,2	3. Upon completion of the course students will have improved their ability to solve problems involving the application of reading, mathematics, manipulative skills, materials and principles from science and economics.
LRN 1,2,4,5 PRO 1,2,3	4. Upon completion of the course the student will have a better understanding of their own abilities, increased awareness of the wide range of job possibilities, knowledge of logical fact finding and decision making procedures and resources and the usual methods for seeking initial jobs and adjusting and progressing in job roles.
LRN 1,2,3,4,5 CON 1	5. Upon completion of the course the students will have increased their ability to interpret consumer information and evaluate the quality of goods and services.
LRN 1,4,5 IND 1 CIT 2	6. Upon completion of the course students will have an increased ability to work safely, pleasantly and cooperatively with others.

SECTION VI

COURSE OUTLINE AND TIME ALLOCATIONS

The major topics of the course are presented as instructional unit titles in Table III. This Table also indicates the amount of time allocated to each unit topic. The course is designed to be taught for one full academic year (180 days or 36 weeks) meeting for one school period each day. An expanded and detailed topical outline of content in each unit is presented with that unit plan.

TABLE III

UNIT TITLES AND TIME ALLOCATIONS

UNIT NO.	UNIT TITLES (TOPICS AND SUB-TOPICS)	TIME ALLOCATIONS
1	Introduction to the course	1 week total
	A. Course requirements	1/2 day
	B. Tour of facilities	1/2 day
	C. Administrative details	1/2 day
	D. General safety rules	1 1/2 days
	E. Student personnel system	1 day
2	Career Planning	4 weeks total
	A. Exploring the world of work	2 days
	B. Career decision making and planning	3 days
	C. Self understanding of abilities	5 days
	D. Career entry skills	10 days
3	Communication	9 weeks total
	A. Visual communication - Drafting careers	15 days
	B. Visual communication - Graphic arts careers	15 days
	C. Electrical communication careers	15 days
4	Principles of Economics/Business/Free Enterprise	4 weeks total
	A. The need for an economic system in a society	3 days
	B. Three basic economic questions	3 days
	C. Resources to participate in the Marketplace	3 days
	D. Economic relationships	3 days
	E. Effects of Government Regulations, Laws, Activities	1 day
	F. Functional parts of a Corporation	2 days
	G. Comparison of American Free Enterprise economy with other systems	1 day
	H. Inflation, recession and depression	2 days

Section VI
Course Outline and Time Allocations

UNIT NO.	UNIT TITLES (TOPICS AND SUB-TOPICS	TIME ALLOCATIONS
5	Manufacturing	8 weeks total
	A. Introduction	1 day
	B. Review major corporate organization and roles	1 day
	C. Holding stock holders meetings	2 days
	D. Selecting company product or design	4 days
	E. Raising capital	1 day
	F. Corporate, accounting	1 day
	G. Setting up for production	13 days
	H. Holding the board of Directors meetings	3 days
	I. Manufacturing production operations	4 days
	J. Organizing and operating a labor union	4 days
	K. Selling the produce	2 days
	L. Liquidation of the company	1 day
6	Construction	5 weeks total
	A. Introduction	1 day
	B. Types of construction	1 day
	C. Construction plans and drawings and maps	2 days
	D. Major construction roles	1 day
	E. Common structure of wood frame buildings	8 days
	F. Simulation of construction roles	9 days
	G. Careers in construction	1 day
7	Energy, Power and Transportation	5 weeks total
	A. Basic definitions and concepts	1 day
	B. Basic principles of force control, simple machines and applied math	2 days
	C. Hydraulic/pneumatic principles and applied math	2 days
	D. Solar energy	4 days
	E. Fire safety for home heating	1 day
	F. Steam power	1 day
	G. Small internal combustion engines	4 days
	H. Commercial power safety for the citizen	1 day
	I. Electrical power measuring units	2 days
	J. Major modes of transportation	1 day
	K. Aero-space transportation	2 days
	L. Careers in energy/power/transportation	2 days

SECTION VII

UNIT PERFORMANCE OBJECTIVES AND EVALUATION CRITERIA

The course content is divided into seven major units. Progress toward the six broad course competency goals (Table II) will be realized through the achievement of the specific objectives for each unit. These unit performance objectives (UPO'S) define the measurable/observable outcomes of instruction and student activity over a relatively short time period (usually one to three days).

Logically, achievement of the Unit Performance objectives implement the course competency goal statements which have already been shown to be related to the achievement or reinforcement of life role coping skills and competencies required for graduation (Table II). The UPO'S and the logical relationships among the three levels of objectives for each unit of instruction are shown in Table IV. This table uses the abbreviation coding system for Life Role Competencies defined in Table I, the numbered course competency goals statements from Table II, and the number of each major unit title from Table III.

Table IV also indicates (by code number) the evaluation instrument utilized to verify achievement of the competency. These instruments are located within each unit plan and presented for ease of copying for class use.

TABLE IV

UNIT PERFORMANCE OBJECTIVES RELATED TO COURSE COMPETENCY GOALS AND LIFE ROLE SKILLS

LIFE ROLE SKILL CODE	COURSE COMP. GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
		UNIT 1. INTRODUCTION TO THE COURSE	
LRN. 1,2,4	4	1.1. Students will be able to identify the specific graduation requirements that can be met by successful completion of this course on written test.	EV 1.1
LRN. 1,2 PRO. 1	4	1.2. Students will be able to identify five of the seven major topics of the course on a written test	EV 1.1
IND. 1 LRN. 2	6	1.3. Students will be able to explain the reason for each of the major safety rules associated with laboratory participation on a written test with 100% accuracy.	

LIFE ROLE SKILL CODE	COURSE COMP. GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
LRN. 4 PRO. 1 IND. 1	4,6	1.4. Students will participate in role playing tasks associated with laboratory management and industrial simulation by being able to identify their individual role at any time. Degree of cooperation and leader/followership skills to be evaluated by rating scales.	EV 1.2
		UNIT 2. CAREER PLANNING	
LRN. 1 PRO. 1	3,4	2.1. Students will be able to identify at least one source of information regarding the description of tasks, working conditions, and employment outlook of an occupation of interest, on a written test.	EV 2.1
LRN. 2 CON. 1 PRO. 1	1,3,4,6	2.2. Students will be able to identify at least three valid reasons for working (engaging in paid employment) in american society on a written test.	EV 2.1
LRN. 2,4 IND. 1 PRO. 2	4,6	2.3. Students will be able to identify at least three valid expectations (rights) of workers in the american economy on a written test.	EV 2.1
IND. 1 LRN. 2 PRO. 2	4,6	2.4. Students will be able to identfy at least three valid expectations that employers have of their workers in the american economy on a written test.	EV 2.1

Section VII
Unit Performance Objectives and Evaluation Criteria (Cont. Table IV)

LIFE ROLE SKILL CODE	COURSE COMP. GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
PRO. 1,2,3 LRN. 1,2		2.5. Students will be able to describe the life time career pattern of at least one occupation in a written report including initial training, job titles, and tasks performed, advancement training and positions and occupational outlook in the field. Report will be evaluated by the instructor for accurate and logical grammar and thought organization.	EV 2.2
LRN. 1,4,5 PRO. 1	4	2.6. Students will demonstrate their understanding of the terms and relationships among the concepts of aptitudes, abilities, cultural values, indicators of job success and logical career decision by selecting the best responses to multiple choice test items with 70% accuracy.	EV 2.3
PRO. 1 LRN. 1 LRN. 2	4	2.7. Students will be able to identify at least five occupations in which they have personal interest, aptitude, and ability to succeed. They will briefly identify and describe these occupations on a written report.	EV 2.4
PRO. 1 LRN. 2	4	2.8. Students will be able to describe in a written report the life-time career patterns of work and training of two different occupations in which they have the aptitude and ability to succeed.	EV 2.5

LIFE ROLE SKILL CODE	COURSE COMP. GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
LRN. 1,2 PRO. 2	4	2.9. Students will be able to interpret job application forms and provide the information requested in a readable manner. Performance will be demonstrated on actual copies of typical employment forms from local companies in a role playing situation. Acceptability will be evaluated by the teacher.	EV 2.6
LRN. 2 PRO. 2	4	2.10. Students will be able to prepare a resume of experiences suitable for seeking a a job. Resume will be free of grammatical and spelling errors.	EV 2.7
LRN. 4,5 PRO. 2	4	2.11. Students will be able to use the telephone to contact possible employers regarding a position. Achievement will be assumed from successful completion of an assignment sheet requiring use of phone book listing and yellow pages.	EV 2.8
LRN. 4 PRO. 2	4	2.12. Students will be able to control their personal behavior and appearance in an acceptable manner while role playing in a simulated job interview. Achievement to be recorded on an observation rating scale.	EV 2.9
PRO. 2 LRN. 2	4	2.13 Students will be able to compose a letter of inquiry concerning a possible job. Letter should (1) contain sources of information, (2) exhibit some understanding of the nature of the position and the willingness and ability of the individual to	EV 2.10

Section VII
Unit Performance Objectives and Evaluation Criteria (Cont. Table IV)

LIFE ROLE SKILL CODE	COURSE COMP GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
		perform that work, (2) provide necessary information for the prospective employer to contact the individual, and (4) be readable and relatively free of grammatical and speclling errors.	
LRN. 1,3 PRO. 2	4	2.14. Students will be able to identify at least three sources of information when seeking employment (on a written quiz).	EV 2.1

LIFE ROLE SKILL CODE	COURSE COMP. GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
		UNIT 3A Communication (visual, drafting)	
LRN. 4	2	3.1. Students will be able to identify by proper name the instruments and equipment normally associated with drafting tasks with 100% accuracy.	EV 3.1
LRN. 4	2	3.2. Students will be able to identify the name and describe the purpose of each of the lines in the alphabet of lines used by draftsman with 90% accuracy.	EV 3.1
LRN. 3,4	2,3	3.3. Students will beable to read a rule, measure and mark off distances to the nearest 1/16 of an inch.	3.2
LRN. 4,5	2	3.4. Students will be able to hand letter information of a specified vertical size in an acceptable manner. Ability will be exhibited on an assigned practice plate critiqued by the instructor.	EV 3.3
LRN. 1,4,5	2,3	3.5. Students will be able to represent objects involving straight lines and/or curves of a specified radius using the principles of orthographic projection. Ability will be evaluated for neatness, accuracy, proper use of projection principles and the alphabet of lines and readable lettering on a final assigned problem.	EV 3.4
LRN. 1,4,5	2,3	3.6. Students will be able to represent objects involving straight lines and 90° intersections using principles of oblique projection. Ability will be evaluated for neatness, proper use of projection, principles, accuracy and readable lettering on a final assigned problem.	EV 3.5

Unit Performance Objectives and Evaluation Criteria (Cont. Table IV)

LIFE ROLE SKILL CODE	COURSE COMP. GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
LRN. 1,2,5	2,3,4	3.7. Students will be able to identify at least three careers which utilize drafting skills and describe the general responsibilities and training needed in each occupation. This ability will be exhibited on a written homework assignment, evaluated for accuracy, completeness, and proper use of grammar and logical thought patterns.	EV 3.6
LRN. 1 PRO. 1	2,3,4	3.8. Students will be able to answer questions regarding projection principles, line use, drafting practices and career titles and roles with 70% accuracy.	EV 3.7
		UNIT 3B Communications (Graphic Arts)	
LRN. 1,2,4	2,3,5	3.9. Students will be able to describe the major principle or characteristic of each of the six basic graphic reproduction processes on a written test with 80% accuracy.	EV 3.8
LRN. 1,4 PRO. 1	4	3.10. Students will be able to identify at least five (5) industries related to or supportive of graphic arts functions.	EV 3.8
LRN. 1,5 PRO. 1	1,3,4,6	3.11. Students will be able to describe the typical graphic arts enterprise in terms of major departmental functions, job titles within departments, and primary tasks of workers within the enterprise.	EV 3.9

LIFE ROLE SKILL CODE	COURSE COMP. GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
		Ability will be exhibited by student teams completing a departmental/personnel organization chart for a typical printing company.	
LRN. 1,2,3, 4,5 PRO. 1	2,3,4,6	3.12. Students will be able to process images photographically making line copies, contact positives and printing mediums in offset or screen printing using darkroom equipment, measuring devices, photochemicals and proper processing procedures. Competency will be judged by inspection of final project and report describing procedures, displaying negatives and/or photo-masks and final result. Students will work in teams of two or more.	EV 3.10
LRN. 1,3,4, 5 PRO. 1 CON. 1	2,3,4,5, 6	3.13. Students will be able to bind printed materials into a book format with hard cover using binders board, thread, glue, and clothe. Competence will be evaluated by inspection of the final product for proper materials, procedure and workmanship. Practice will continue until an acceptable result is achieved.	EV 3.11
LRN. 3,5 PRO. 1 CON. 1	1,3,5	3.14. Students will be able to identify factors which affect the cost of printed products and calculate the cost of their own project when asked to do so on a written test, with 90% accuracy.	EV 3.12

LIFE ROLE SKILL CODE	COURSE COMP. GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
LRN. 1,3,4,5 CON. 1 PRO. 1	1,2,3,4,5	3.15. Students will be able to answer objective questions regarding photographic, printing and binding principles and procedures, careers in graphic arts, and cost estimation in graphic arts with 70% accuracy.	EV 3.13
		UNIT 3C Communication (Electrical)	
LRN. 1,4,5 IND. 1 PRO. 1	2,3,4,6	3.16. Students will be able to interpret simple schematics containing a power source, control switch of devices, conducting lines and a power user, and actually create the circuits depicted in the laboratory, demonstrating the operation of the circuit. Competence will be demonstrated in the successful completion of lab assignments demonstrating a telegraph sender/receiver, a crystal radio receiver, an audio amplifier, and a fibre optic communication line. Students will work in teams of two or more.	EV 3.14
LRN. 1,2,5	3	3.17. Students will be able to explain the relationships among the concepts of physical motion, magnetism, and electrical impulse generation as basic principles of operation of the telegraph sounder, the telephone receiver, the microphone and the loud speaker by written reports on these communication devices. Reports will be evaluated for logical thought patterns, cause and effect relationships, accuracy and correct language usage.	EV 3.15

LIFE ROLE SKILL CODE	COURSE COMP. GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
LRN. 1,2,3,4,5 CON. 1	2,3,5	3.18. Students will be able to describe the function of communication amplifiers in terms of the relative magnitude and linearity of input and output signals and real power sources when asked to do so on a written test.	EV 3.16
LRN. 1,2,4,5 CON. 1	3,4,5	3.19. Students will be able to define the following terms which describe the basic principles of radio communication: carrier wave, amplitude modulation frequency modulation antenna, tower, tuning circuit, detector, audio amplifier, speaker or headphones on a written test with 90% accuracy.	EV 3.16
LRN. 1,2,4,5	3,4,5	3.20. Students will be able to describe the basic operation of the following communication systems on written homework assignments: television, radar, satellite, and laser - fiber optic systems. Reports will be evaluated for identification of basic concepts and components of the system, accuracy of function of components and correct language usage.	EV 3.17 3.18 3.19 3.20
CON. 1	5	3.21. Students will demonstrate an understanding of the purpose of mass communication advertising and the economic trade-offs which support the system through correct responses to true and false questions regarding the system with 70% accuracy.	EV 3.16

Section VII
Unit Performance Objectives and Evaluation Criteria (Cont. Table IV)

LIFE ROLE SKILL CODE	COURSE COMP. GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
LRN. 1,4,5	1,3,4	3.22. Students will be able to identify many of the career roles involved in an electronic communication enterprise. Competence will be evaluated by inspection of the student prepared organization chart for a typical communication company. Examples: Radio or TV station, advertising production, recording studio, home cable TV service, or etc. Chart should show major departments, job titles, responsibilities.	EV 3.21
LRN.1,2,4 CIT. 1 PRO. 1	4,5	3.23. Students will be able to describe the role of the Federal Communications Commission in station license approval, frequency allocations, interference elimination and enforcement when asked to do so on a written test.	EV 3.16
IND. 1,2 CON. 1 PRO. 1	2,3,5	3.24. Students will develop the ability to make and solder electrical connections.	EV 3.22
LRN. 1,2,3,4,5 IND. 1,2 CIT. 2	1,2,3,4	3.25. Students will be able to respond correctly to 70% of the items on an objective test covering principles, concepts, systems, economic organizations and careers related to electrical communications.	EV 3.23

LIFE ROLE SKILL CODE	COURSE COMP. GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
		UNIT 4. FREE ENTERPRISE	
LRN. 1,2,4 CON. 1 PRO. 1,2,3 CIT. 1	1	4.1. Upon completion of the unit, students will explain with 100% accuracy on a written test the basic economic problem facing all societies.	EV 4.1
LRN. 5 CON. 1 PRO. 1 CIT. 1	1	4.2. Identify with 100 percent accuracy on a written test the three questions facing every economic system and analyze how our siciety has organized to solve those questions.	EV 4.1
CON. 1 PRO. 1 IND. 1 CIT. 1	1,5	4.3 Explain with 100% accuracy in writing the interrelationships that exist among natural, human, and capital resources and human needs and wants.	EV 4.1
PRO. 1,2,3 CIT. 1,2	1,3	4.4 Explain how specialization permits scarce resources to be more efficiently used and assess why it is important for both domestic and international economic activity.	EV 4.1
LRN. 2,5 CON. 1 PRO. 1,2 CIT. 1	1,3,5	4.5 Demonstrate with charts how prices are determined by the supply of and demand for each good, service, or factor of production.	EV 4.2
LRN. 5 CIT. 1,2	1,3,5	4.6 Complete and debrief a decision-making exercise using a method of problem solving designed for making economic choices.	EV 4.1
CON. 2 PRO. 1,2 CIT. 1,2,3	1,4	4.7 Describe with 100% accuracy the characteristics of the free enterprise system.	EV 4.1
CON. 1,2 PRO. 1,2,3 CIT. 1,2	1,3	4.8 Describe and analyze in a paper how the profit motive helps to determine resource allocation and distribution of income.	EV 4.1

3 Communication (Cont.)

e. Preparing a script for a one minute announcement or advertisement for use by radio or television
f. Estimating the cost per customer for delivery of a satellite TV signal by private cable

UNIT PERFORMANCE OBJECTIVES

UNIT THREE

UNIT PERFORMANCE OBJECTIVES		EVAL INSTRUMENT CODE
UNIT 3A	Communication (visual, drafting)	
3.1	Students will be able to identify by proper name the instruments and equipment normally associated with drafting tasks with 100% accuracy.	EV 3.1
3.2	Students will be able to identify the name and describe the purpose of each of the lines in the alphabet of lines used by draftsman with 90% accuracy.	EV 3.1
3.3	Students will be able to read a rule, measure and mark off distances to the nearest 1/16 of an inch.	EV 3.2
3.4	Students will be able to hand letter information of a specified vertical size in an acceptable manner. Ability will be exhibited on an assigned practice plate critiqued by the instructor.	EV 3.3
3.5	Students will be able to represent objects involving straight lines and/or curves of a specified radius using the principles of orthographic projection. Ability will be evaluated for neatness, accuracy, proper use of projection principles and the alphabet of lines and readable lettering on a final assigned problem.	EV 3.4
3.6	Students will be able to represent objects involving straight lines and 90° inter-sections using principles of oblique projection. Ability will be evaluated for neatness, proper use of projection, principles, accuracy and readable lettering on a final assigned problem.	EV 3.5
3.7	Students will be able to identify at least three careers which utilize drafting skills and describe the general responsibilities and training needed in each occupation. This ability will be exhibited on a written homework assignment, evaluated for accuracy, completeness, and proper use of grammar and logical thought patterns.	EV 3.6

UNIT PERFORMANCE OBJECTIVES

UNIT 3A	Communication (visual, drafting) (Cont.)	
3.8	Students will be able to answer questions regarding projection principles, line use, drafting practices and career titles and roles with 70% accuracy.	EV 3.7
UNIT 3B	Communications (Graphic Arts)	
3.9	Students will be able to describe the major principle or characteristic of each of the six basic graphic reproduction processes on a written test with 80% accuracy.	EV 3.8
3.10	Students will be able to identify at least five (5) industries related to or supportive of graphic arts functions.	EV 3.8
3.11	Students will be able to describe the typical graphic arts enterprise in terms of major departmental functions, job titles within departments, and primary tasks of workers within the enterprise Ability will be exhibited by student teams completing a departmental/personnel organization chart for a typical printing company.	EV 3.9
3.12	Students will be able to process images photographically making line copies, contact positives and printing mediums in offset or screen printing using darkroom equipment, measuring devices, photochemicals and proper processing procedures. Competency will be judged by inspection of final project and report describing procedures, displaying negatives and/or photo-masks and final result. Students will work in teams or two or more.	EV 3.10
3.13	Students will be able to bind printed materials into a book format with hard cover using binders board, thread, glue, and clothe. Competency will be evaluated by inspection of the final product for proper materials, procedure and workmanship. Practice will continue until an acceptable result is achieved.	EV 3.11

UNIT PERFORMANCE OBJECTIVES

UNIT 3B	Communication (Graphic Arts (Cont.)	
3.14	Students will be able to identify factors which affect the cost of printed products and calculate the cost of their own project when asked to do so on a written test, with 90% accuracy.	EV 3.12
3.15	Students will be able to answer objective questions regarding photographic, printing and binding principles and procedures, careers in graphic arts, and cost estimation in graphic arts with 70% accuracy.	EV 3.13
UNIT 3C	Communication (Electrical)	
3.16	Students will be able to interpret simple schematics containing a power source, control switch of devices, conducting lines and a power user, and actually create the circuits depicted in the laboratory, demonstrating the operation of the circuit. Competence will be demonstrated in the successful completion of lab assignments demonstrating a telegraph sender/receiver, and audio amplifier, and a fibre optic communication line. Students will work in teams of two or more.	EV 3.14
3.17	Students will be able to explain the relationships among the concepts of physical motion, magnetism, and electrical impulse generation as basic principles of operation of the telegraph sounder, the telephone receiver, the microphone and the loud speaker by written reports on these communication devices. Reports will be evaluated for logical thought patterns, cause and effect relationships, accuracy and correct language usage.	EV 3.15
3.18	Students will be able to describe the function of communication amplifiers in terms of the relative magnitude and linearity of input and output signals and real power sources when asked to do so on a written test.	EV 3.16
3.19	Students will be able to define the following terms which describe the basic principles of radio communication: carrier wave, amplitude modulation, frequency modulation, antenna, tower, tuning circuit, detector, audio amplifier, speaker or head-phones on a written test with 90% accuracy.	EV 3.16

UNIT PERFORMANCE OBJECTIVES

UNIT 3C Communication (Electrical) (Cont.)

3.20	Students will be able to describe the basic operation of the following communication systems on written homework assignments: television, radar, satellite, and laser - fiber optic systems. Reports will be evaluated for identification of basic concepts and components of the system, accuracy of function of components and correct language usage.	EV 3.17 3.18 3.19 3.20
3.21	Students will demonstrate an understanding of the purpose of mass communication advertising and the economic trade-offs which support the system through correct responses to true and false questions regarding the system with 70% accuracy.	EV 3.16
3.22	Students will be able to identify many of the career roles involved in an electronic communication enterprise. Competence will be evaluated by inspection of the student prepared organization chart for a typical communication company. Examples: Radio or TV station, advertising production, recording studio, home cable TV service, or etc. Chart should show major departments, job titles, responsibilities.	EV 3.21
3.23	Students will be able to describe the role of the Federal Communications Commission in station license approval, frequency allocations, interference elimination and enforcement when asked to do so on a written test.	EV 3.16
3.24	Students will develop the ability to make and solder electrical connections.	EV 3.22
3.25	Students will be able to respond correctly to 70% of the items on an objective test covering principles, concepts, systems, economic organizations and careers related to electrical communications.	EV 3.23

LESSON PLAN

3.A Communication - Introduction to Drafting
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 3 (NO.) LESSON: 1 (NO.) UNIT PERFORMANCE OBJECTIVE: 3. 1 (CODE NO.) COMPETENCY VERIFICATION EV 3.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify drafting instruments, equipment and materials by proper names and descriptive functions.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	For each student, an assigned drafting table drawing board, "T" square, 30°-60° triangle, 45° triangle, measuring scale, compass, dividers and drafting paper with drafting tape available. Student supplies pencils and erasers, cleaning pads, eraser shield, and templates optional.	1. Explain the purpose of drafting as communication among people regarding the size, shape, and processing of objects to be manufactured or constructed.	Listen
5		2. Assign work stations and equipment to students.	Receive materials Accept responsibility for materials
10		3. Name and demonstrate the use of each item	
		4. Identify names and sources of specialized pencils and erasers they should purchase	Make plans to procure items

LESSON PLAN (CONTINUED): 3 UNIT NO. 1 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
25	Assignment sheet describing standard drafting format for local school. Paul Wallach, The Basic Book of Drafting, pages 43-45	5. Assign basic exercise requiring use of "T" square, triangles, and pencils to draw standard border and title blocks on drafting paper.	Draw border and title block lines
5	Walter C. Brown Drafting, Chapter I, pages 6 - 24.	6. Make reading assignment	Read (for homework)
		7. Storage and clean-up directions	Secure items and participate in clean up.

LESSON PLAN

3.A. 1. A Drafting Materials and Instruments
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 3 (NO.) LESSON: 2 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.3 (CODE NO.) COMPETENCY VERIFICATION EV 3.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to use drafting instruments to draw lines and curves in correct locations - measuring and instrument exercises.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	 STUDENTS
5	Paul Wallach, The Basic Book of Drafting, pages 19-39	1. Explain the divisions on a standard English rule.	Listen
5	Walter C. Brown, Drafting, pages 6-20	2. Demonstrate measuring techniques A. Measuring distances on objects B. Marking off distances on paper C. Setting dividers for specified distances D. Setting compass to specified radius	Listen Observe
5		3. Demonstrate techniques for drawing uniform lines A. Horizontal B. Vertical C. Pencil rotation D. Pencil angle constant E. Angle lines F. Curved lines with compass	Observe
35	Assignment sheet	4. Assign exercises	Complete assignment exercises requiring measurement in fractions of an inch, straight lines, and curved lines

LESSON PLAN

3.A.C Free Hand Lettering
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 3 (NO.) LESSON: 3 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.4 (CODE NO.) COMPETENCY VERIFICATION EV 3.3 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to hand letter information on drafting plates in an acceptable manner.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
5	Walter C. Brown Drafting, Pages 45-48	1. Explain the purpose and importance of good hand lettering.	Listen Observe
5	Information sheet describing stroke directions for various letters (p. 46)	2. Explain and demonstrate the use of a beginners guide sheet in determing the proper stroke directions in the formation of various letters	
5		3. Explain and demonstrate use of horizontal size guidelines	
30	Assignment sheet	4. Assign lettering practice plate	Practice guided lettering techniques
5	Pages 45-48 reference	5. Assign reading - clean up	Read

LESSON PLAN

3.A. 1.b.d.e. Alphabet of Lines in Size and Shape Description
(TOPICAL OUTLINE CODE NO. AND TITLE) PAGE 1 OF 2

UNIT: 3 (NO.) LESSON: 4,5 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.2,5 (CODE NO.) COMPETENCY VERIFICATION EV 3.1;3.4 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to use the alphabet of lines to describe a simple rectangular object with a hidden feature using orthographic projection techniques.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
5	Rectangular object with hidden feature chalk board or overhead projector. Walter C. Brown, Drafting, pages 31-41	1. Explain the three principle points of view used to describe an object using orthographic projection. A. Top or plan view B. Front C. Right side	Observe Listen
15	Paul Wallach, The Basic Book of Drafting, pages 55-52	2. Using a simple object, explain how each view is projected and name the various lines needed to complete the view.	
15	Previously prepared "fold out box" showing the three standard views of an object in proper relationship.	3. Using a "fold out box" explain the reason for the standard position of each view with relation to the other views. Show how information can be transferred from view to view.	
5		4. Add very basic dimensions to the views (save rules for another lesson)	
5	Paul Wallach, The Basic Book of Drafting, Fig. 10-5, page 41	5. Review appearance and purpose of lines in the basic alphabet of lines	

LESSON PLAN (CONTINUED):

UNIT NO. 3

LESSON NO. 4,5

PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	 STUDENTS
		A. Object lines B. Hidden lines C. Extension lines D. Dimension lines E. Construction lines	
5	Assignment sheet	6. Assign orthographic drawing of simple rectangular object with hidden feature	Complete drafting assignment
50		7. Supervise student practice and provide assistance as needed.	

LESSON PLAN

3.A. 1.d Shape Description - Interpreting Orthographic Drawings
(TOPICAL OUTLINE CODE NO. AND TITLE)
PAGE 1 OF 2

UNIT: 3 (NO.) LESSON: 6 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.5 (CODE NO.) COMPETENCY VERIFICATION EV 3.4 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to interpret the shape of objects drawn using orthographic projection well enough to form the object in clay.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
5	One 4 oz. lump of clay for each student. Popcycle stick/clay cutter for each student (some may wish to use jack knives if the school permits)	1. Distribute clay lumps and clay cutters 2. Free hand sketch simple object on chalk board	Receive
5		3. Demonstrate forming and cutting clay to the shape described on the board	Observe
35		4. Assist students in visualizing and forming the object. A. Cut overall top plan shape (profile) B. Cut overall front view shape C. Cut overall side view shape D. Add details, holes, intersecting planes, etc.	Visualize object, form and cut to shape

LESSON PLAN (CONTINUED): 3 UNIT NO. 6 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
		5. Repeat process a number of times with different objects to develop visualization skills	Practice visualization and shape formation
	Walter C. Brown, Drafting, pages 48-51 Paul Wallach, The Basic Book of Drafting, pages 63-68	6. Assign reading on dimensioning	Read

LESSON PLAN

3.A.1.e. Size Description - Dimensioning
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 3 (NO.) LESSON: 7,8 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.5 (CODE NO.) COMPETENCY VERIFICATION EV 3.4 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to apply the general practices of good dimensioning to drawings of objects.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
5	Paul Wallach, The Basic Book of Drafting, pages 63-68	1. Explain the basic functions of dimensions A. Overall sizes B. Locating features C. Processing notes, drill, ream, etc. D. Size of features	Listen
10		2. Demonstrate correct formation and placement of A. Extension and dimension lines B. Arrowheads C. Numerals, fractions D. Leaders E. Processing notes	
5	Solid model of object to be drawn	3. Assign problem to be drawn in orthographic projection with full dimensions	
30		4. Supervise and provide assistance to students as needed	Draw object with full dimensions and notes
50		5. Continue supervision of assigned dimensioned problem	

LESSON PLAN

3.A.1.f. Pictorial Sketching and Drafting
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 3 (NO.) LESSON: 9,10 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.5 (CODE NO.) COMPETENCY VERIFICATION EV 3.5 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to create pictorial views of simple objects using oblique projection.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
5	Walter C. Brown, *Drafting*, pages 76-77.	1. Explain the purpose of pictorial drawings	Listen
	Examples of pictorial drawings	2. Show examples of pictorial drawings and name them A. Oblique B. Isometric C. Perspective	Observe
	Information sheet with procedure, page 76	3. Distribute information sheet	
10	Chalk board, graph or isometric sketching paper	4. Demonstrate how to sketch rectangular object using steps of procedure on information sheet	Observe Ask questions
20	Alternate resource, Paul Wallach, *The Basic Book of Drafting*, pages 78-82	5. Direct the class in sketching several objects until the procedure is apparently understood. Provide individual and group assistance	Sketch objects
15		6. Assign problem to be drawn mechanically in oblique	Start mechanical drafting in oblique
		7. Provide individual assistance as needed	
50		8. Continue to provide individual assistance	Finish drafting assignment

LESSON PLAN

3.A.2 Drafting Related Careers
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 3 (NO.) LESSON: 11,12 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.7 (CODE NO.) COMPETENCY VERIFICATION EV 3.6 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to describe the primary tasks/responsibilities of the following drafting related careers: Engineer architect, draftsperson, tracers, drafting programmers.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
20	Paul Wallach, The Basic Book of Drafting, pages 7-8. Walter C. Brown, Drafting Pages 42-44.	1. Identify the common drafting related careers. Describe their tasks/responsibilities and explain any interrelationships	Listen Take notes
5	Occupational Outlook Handbook. Dictionary of Occupational Titles	2. Assign students to select any three drafting related careers and to prepare a brief written report on those careers	Gather data Compose report describing career tasks and outlook for the careers following assignment sheet.
25	Assignment sheet to guide activity	3. Provide individual assistance as needed	

LESSON PLAN

3.A Visual Communication - Drafting Competency Verification
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 3 (NO.) LESSON: 13 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.5 (CODE NO.) COMPETENCY VERIFICATION EV 3.2; 3.3;3.4 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to verify competency to draw simple object using principles of orthographic projection.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
10	Competency Evaluation Sheet 3.4 for class distribution. Solid object to be drawn.	1. Explain purpose of competency verification	Listen Ask questions
		2. Review criteria used to evaluate work A. Neatness B. Correct procedure C. Accuracy of measurement D. Correct line usage E. Correct dimensioning F. Readable lettering	
40		3. Administer evaluation sheet 3.4	Visualize views and draw object as assigned

LESSON PLAN

3.A Visual Communication - Drafting Competency Verification
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 3 (NO.) LESSON: 14 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.6 (CODE NO.) COMPETENCY VERIFICATION EV 3.2; 3.3;3.5 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to represent a simple object with rectangular features using oblique projection principles.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	Competency Evaluation Sheet 3.5 for class distribution.	1. Explain purpose of competency verification	Listen Ask questions
5		2. Review criteria used to evaluate work A. Neatness B. Correct procedure C. Accuracy of measurement D. Correct line usage E. Correct dimensioning F. Readable lettering	
40	Solid object to be drawn	3. Administer evaluation sheet 3.4	Draw object as assigned

LESSON PLAN

3.A Visual Communication - Drafting Competency Verification
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 3 (NO.) LESSON: 15 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.7 (CODE NO.) COMPETENCY VERIFICATION EV 3.1;3.7 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to answer questions with 70% accuracy regarding drafting related careers, procedures, etc.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	Competency evaluation	1. Review purpose and extent of competency verification	Listen
		2. Explain basis of evaluation	Ask questions
30		3. Administer evaluation sheets	Respond to items
10		4. Review and answer questions following tests	Ask questions
5	All blank assignments sheets from unit 3	5. Be sure all materials from unit 3 have been submitted by students	Submit work not previously handed in

LESSON PLAN

3.A.3. a.b. Graphic Arts - Introduction and Description of Processes
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 3 (NO.) LESSON: 16 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.9;3.10 (CODE NO.) COMPETENCY VERIFICATION EV 3.7 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be exposed to the broad scope of the graphic arts related industries and recognize the visual communication role involved in most phases of civilized life, mass communication, packaging traffic control and etc.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10	Common examples of printing processes and products for example: 1. Screened "T" shirt 2. Rotogravure section of Sunday paper 3. Die cut package 4. Photographic portrait 5. Rubber stamp 6. 4 color lithograph 7. Milk jug 8. Oreo cookies 9. Traffic signs	1. Introduce students to graphic arts unit by displaying examples of at least six different printing processes on common every day products.	Observe examples
		2. Explain that students will learn how any image can be faithfully reproduced in multiple copies on any medium.	
30		3. Introduce film which will give them a broad view of the world of graphic arts with some historical facts	

LESSON PLAN (CONTINUED): 3 UNIT NO. 16 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
	Filmstrip - 28 mins. Graphic Communication Education Program Sl.1 Orientation To Graphic Communication Industries Clemson University South Carolina Department of Education and PICA Foundation	4. Show film	Observe film
5		5. Conduct summary discussion. Tell students which processes they will actually be performing in this unit.	Listen Ask questions Take notes
5	John R. Walker, Graphic Arts Fundamentals, Pages 7-28 or Robert M. Swerdlow, Introduction to Graphic Arts, pages 1-10 and 38-42.	6. Assign reading on the history of graphic arts processes	Read

LESSON PLAN

3.3 a.b.c Basic Graphic Processes
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 3 (NO.) LESSON: 17 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.9 (CODE NO.) COMPETENCY VERIFICATION EV 3.8 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to describe six basic printing processes and identify an example of their use. They will be exposed to some historical facts and statistics regarding the importance of each process.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PPESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	Overhead transparencies by DCA Graphic Arts Volume 1. DCA Educational Products, Inc. or Filmstrip 28 mins. Graphic Communication Education Program Sl.1 Orientation To Graphic Communication Industries Clemson University South Carolina Department of Education and PICA Foundation.	1. Introduce slide program or start with first transparency	Listen
		2. Tell students to organize their notes to highlight six basic processes 1. Letterpress 2. Lithography or offset 3. Stencil or screen 4. Intaglio 5. Photographic 6. Electrostatic	Take notes

LESSON PLAN (CONTINUED): 3 UNIT NO. 17 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
30	Robert Swerdlow, Introduction to Graphic Arts, pages 5-35	3. For each process, illustrate the main operational principle, provide some examples of its use, and give some indication of its relative importance to the industry. This will entail stopping the cassette program for supplimentary information quite occasionally.	Listen Take notes Ask questions
		4. Ask summary questions requiring students to distinguish among processes.	Respond to questions
		5. Assign reference for reading	Read

LESSON PLAN

3.A.3.d Supporting and Related Industries
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 3 (NO.) LESSON: 18 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.10 (CODE NO.) COMPETENCY VERIFICATION EV 3.8 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to describe at least five supporting industries related to the graphic arts.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
5	Encyclopedia, library or resource center	1. Identify and briefly describe the following supporting or related industries. A. Pulp and paper manufacture B. Ink, paint production C. Packaging industry D. Advertizing E. Mass communication F. Equipment manufacturing G. Photo-chemical and film production H. Scientific research	Listen Take notes
5	Assignment sheet for "fact finding" missions	2. Divide the class into two groups. Explain that one group will be conducting a fact finding mission regarding the first four related industries while you are presenting lesson No. 19 to the other half of the class. Then tomorrow the group roles will be reversed	

LESSON PLAN (CONTINUED): 3 UNIT NO. 18 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5		3. Distribute fact finding assignment sheets and dismiss first group to library or resource area.	Find data, simple facts about the related or supporting industries. Record each fact for later discussion.
35		4. Take second group to dark-room for lesson 19.	Observe

LESSON PLAN

3.A.3.f Printing Operations - Photography
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 3 (NO.) LESSON: 19 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.12 (CODE NO.) COMPETENCY VERIFICATION EV 3.10 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to use a process camera to expose a line negative and process the negative.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
10	Process camera litho film (Dupont CoS-4 or Kodalith) Processing chemicals (A & B developers) (Stop bath) (Fixer)	1. Explain that photography is basic to most of the modern graphic arts processes	Listen Observe Ask questions Take notes
10	Enlarger. Examples of Line images suitable for greeting card applications	2. Demonstrate actual use of the process camera for shooting a 1.1 line negative. Provide students with exposure and processing times worked out for local materials and equipment.	
	A properly processed line negative	3. Using the prepared line negative, demonstrate the making of a film positive by the enlarger - control method	
		4. Explain that photo offset printing requires a negative film image while photo screen printing requires a positive film image.	

LESSON PLAN (CONTINUED):

UNIT NO. 3

LESSON NO. 19

PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10		5. Ask a selected student to shoot an image and process it under group supervision	Follow procedures Provide promption cues
	Robert M. Swerdlow *Introduction to Graphic Arts*, pages 158-165 and 175-183	6. Ask summarizing questions	Respond to questions
		7. Assign reading on exposure and processing a line negative	Read as homework

3.A.3.D Supporting and RElated Industries and
3.A.3.F Printing Operations - Photography

LESSON PLAN

(TOPICAL OUTLINE CODE NO. AND TITLE) PAGE 1 OF 1

UNIT: 3 (NO.) LESSON. 20 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.10; 3.12 (CODE NO.) COMPETENCY VERIFICATION EV 3.8;3.10 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Continuation of lessons 18 and 19 with interchanged group roles

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
5		1. Maintain class division as in lesson 19	Listen
	Fact finding assignment sheet	2. Make fact finding assignment to second group (related industries)	Group 2 - Find facts regarding last four related industries listed in lesson 18
35	Same as lesson 19	3. Take first group into darkroom and present lesson 19 assigning reading to the group	Group 1 - Listen and observation of demonstration in lesson 19
10	Assignment sheet for greeting card assignment	4. Allow this group to start gathering images for a greeting card project	Plan greeting card

LESSON PLAN

3.A.3.d. Student Presentation of Facts About Related Industries
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 3 (NO.) LESSON: 21 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.10 (CODE NO.) COMPETENCY VERIFICATION EV 3.8 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will orally present and organize facts regarding the graphic arts related industries.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
25	Students should be prepared with "Facts" they have found regarding the graphic arts related industries	1. Select a representative from each group to act as recorder on the chalk board board before the class.	Volunteer to serve
		2. Ask representative to write facts about the paper and pulp industry on the board as a heading	
		3. Ask members of this group to volunteer facts they have discovered regarding this industry	Volunteer information
		4. Tell all students to take notes while facts are recorded on the board	Take notes
		5. Repeat for each of the four industries assigned to group #1. Rotate the recorders position with each new heading	Orally participate
		NOTE: Since there are eight industries - move the group along	

LESSON PLAN (CONTINUED): 3 UNIT NO. 21 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
25		6. Repeat the procedure for group two and their topics	

LESSON PLAN

3.A.3 f.(2) Printing Operations (Offset option)
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 3 (NO.) LESSON: 22,23 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.12;3.15 (CODE NO.) COMPETENCY VERIFICATION EV 3.10;3.13 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to strip in images on a masking sheet, expose and process offset plate and run image on prepared press.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
5	Film negative, masking sheet, printing plate, processing chemicals, offset press, exposure unit.	1. Ahead of class, prepare press for printing operations.	
		2. Provide overview of operations prepared by: A. The stripper B. The platemaker C. The pressmen	
5	Paper stock	3. Demonstrate stripping in a negative to prepare a flat	Observe Listen
5		4. Demonstrate operation of plate maker in exposing the plate through the flat	
5		5. Demonstrate processing the plate image A. Desensitize B. Develop with red lacquer C. Wash D. Protect with gum arabic	

LESSON PLAN (CONTINUED):

3 UNIT NO.

22,23 LESSON NO.

PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10		6. Demonstrate installation of plate in printing press (press already prepared) and making press run on prepared paper stock	
70	Greeting card production Assignment sheet	7. Supervise and assist students in following the procedures to begin production of an assignment sheet (a few should have started from lesson #20)	Work in teams of at least two per team on production of greeting card

LESSON PLAN 3.A.3.F.(2) Printing Operations (screen option)
(alternate) (TOPICAL OUTLINE CODE NO. AND TITLE) PAGE 1 OF 2

UNIT: 3 (NO.) LESSON: 22,23 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.12;3.15 (CODE NO.) COMPETENCY VERIFICATION EV 3.10;3.13 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to expose presensitized photo screen material and process it, adhere it to a prepared screen, blockout background, print and clean up.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	PICA Filmstrip with audio cassette. Precut screening. (Dynex #10xx) screen frame	1. Demonstrate mounting screen to frame using cord and stretch-tite tool	Observe Listen Ask questions
5	Polyester mesh prep (or comet)	2. Demonstrate scrubbing screen with mesh prep and rinsing	
5	Ulano Blue Poly-3 or Ulano Hi Fi Green	3. Demonstrate exposure of presensitized film	
5	Ulano A & B powdered developers	4. Demonstrate developing and washing out imate (developer previously mixed)	
5		5. Demonstrate adhering to screen A. Build up on frame base B. Weights on frame	
5		6. Demonstrate peeling away backer (on previously prepared screen)	
5	Commercial block out, glue or paper tape	7. Demonstrate background blockout	

(Alternate)

LESSON PLAN (CONTINUED): 3 UNIT NO. 22,23 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10		8. Demonstrate printing technique A. Registration - setting paper feed guides B. Use of squeegee C. Print handling storage, and drying	
5		9. Demonstrate clean-up	
50		10. Supervise and assist students in production of greeting card using photo screen methods	Students work in teams of two to produce greeting cards

LESSON PLAN 3.A.3.e Organization of the Printing Industry (Careers)

(TOPICAL OUTLINE CODE NO. AND TITLE) PAGE 1 OF 1

UNIT: 3 (NO.) LESSON: 24,25 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.11 (CODE NO.) COMPETENCY VERIFICATION EV 3.9;3.13 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to describe the typical graphic arts enterprise in terms of departmental functions, job titles and primary tasks

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	William P. Spence and David Vequist Graphic Reproduction, pages 36 -37	1. Present the personnel chart for a typical offset printing company (Reference page 36)	
10	Dennis and Jenkins, Graphic Arts, Chapter 1 chalk board or overhead projector	2. Within each department, describe or explain A. Departmental functions B. Job titles C. Primary tasks	
65	Assignment sheet	3. Assign students to make enlarged organization chart	Students in groups of two or three will make an enlarged organization chart of a graphic arts industry, clearly showing departments, functions, job titles and primary duties.

LESSON PLAN 3.A.3.g.1 Construction of Loose Leaf Binder
(TOPICAL OUTLINE CODE NO. AND TITLE) PAGE 1 OF 1

UNIT: 3 (NO.) LESSON: 26,27 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.13 (CODE NO.) COMPETENCY VERIFICATION EV 3.11;3.13 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to construct a loose leaf notebook binder using binders board, clothe, and glue.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10	Dennis and Jenkins Graphic Arts Page 479 Assignment sheet	1. Demonstrate the procedures for use of a braming square in accurate layout of clothe - following diagram on assignment sheet	Listen Observe Ask questions Take notes
5	Framing square, binders clothe	2. Demonstrate cutting of clothe	
10	Binders board, heavy duty paper cutter	3. Demonstrate layout and cutting of binders board (emphasize safety)	
10		4. Demonstrate glueing of board to clothe with properly folded edges and corners, crease hinge areas.	
5		5. Demonstrate use of book-binding press	
5		6. Explain that similar skills and materials are used for book binding and/or book repair	
5		7. Demonstrate drilling of holes for installation of binding posts or fancy string.	
50		8. Assign students to construct their own loose leaf binder for class notes or photo album	Construct a loose leaf binder following procedures.

LESSON PLAN

3.A.3.h Graphic Arts Cost Estimations and Laboratory Practice
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 3 (NO.) LESSON: 28,29 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.14 (CODE NO.) COMPETENCY VERIFICATION EV 3.12;3.13 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify factors which affect the cost of printed products and calculate costs of their own projects.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
10	Information sheet listing the unit costs of materials used in the graphic arts laboratory	1. Ask students to identify sources of expense to a printing enterprise, list on board as they respond. Include at least: A. A place to work, Rent, taxes, building maintenance, mortgage payments. B. People to perform work, labor, fringe benefits, recruitment, managers, salesmen C. Utility services, heat, air conditioning, water, sewage D. Specialized equipment E. Material costs -paper, ink, processing chemicals, film, unavoidable waste F. Distribution/delivery costs G. Accounting/reporting costs	Identify sources of expense and orally respond to questions. Take notes
10	Assignment sheet	2. Distribute information and assignment sheet and explain the procedure for determing costs of projects completed by students (notebook, greeting card)	Read Interpret unit costs

LESSON PLAN (CONTINUED): 3 UNIT NO. 28,29 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
		3. Assign students to fill out and return cost sheets as homework	Analyze and calculate project costs as homework
89		4. Open laboratory time - assign students to work on laboratory assignments not previously finished	Perform laboratory operations

LESSON PLAN

3.3.A. Competency Verification in Graphic Arts
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 3 (NO.) LESSON: 30 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.15 (CODE NO.) COMPETENCY VERIFICATION EV 3.13 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will submit all work previously not turned in with regard to graphic arts and will respond to questions, verifying graphic arts related competencies.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
5	Evaluation sheets 3.12, and blank copies of all assignment sheets.	1. Explain purpose of competency verification	Listen
		2. Collect all assignments not previously submitted	Submit work
10		3. Review major topics to be tested	Ask questions
35		4. Administer test, EV 3.12	Respond to test items

LESSON PLAN

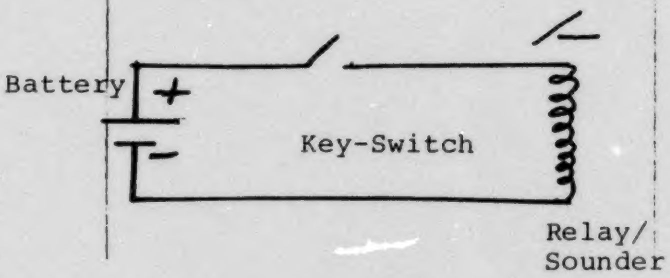
3.B.1 Electrical Communication, Schematics, Coding/Decoding
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 3 (NO.) LESSON: 31 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.16 (CODE NO.) COMPETENCY VERIFICATION EV 3.14 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to interpret single schematics and create circuits following a schematic. Students will also be able to send and receive coded electrical messages.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5		1. Introduce the concept of the electrical schematic as a plan for assembly and a visual aid to explanation (communication) of circuit action.	Listen
5	Actual electrical devices which are symbolized	2. Show symbols for A. Power sources B. Conductors C. Power users D. Switches and control devices	Take notes
5	Demonstration circuit	3. Demonstrate the schematic and operation of a simple relay connected as a one way telegraph	



LESSON PLAN (CONTINUED): 3 UNIT NO. 31 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
5	Chart showing International Morse Code	4. Ask how messages could be sent long distances using this circuit (coding/ decoding). Explain briefly the morse code	Respond
5		5. Explain that modern digital computer equipment operates on a simple on/off Bimary code.	
30	Assignment sheets, Batteries, switches, bell wire, relay/ sounders, door bells	6. Assign students to consent the simple telegraph circuit and sent messages between remote locations of the laboratory	Follow schematic and connect circuit. Send and receive messages

LESSON PLAN 3.B.2 and 3.B.12.a Electrical Communication Lines - Types and Connections
(TOPICAL OUTLINE CODE NO. AND TITLE) PAGE 1 OF 2

UNIT: 3 (NO.) LESSON: 32 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.24 (CODE NO.) COMPETENCY VERIFICATION EV 3.22 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to recognize and identify one use for each of the standard conductors such as parallel cord, 300 ohm antenna lead, and 72 or 75 ohm shielded cable and be able to make, solder and protect standard connections.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	6" lengths of the following conductors (enough for class distribution of each) Lamp cord, speaker wire	1. Explain that electrical communication requires various types of conductors which are found in almost every home	Listen
5	300 ohm antenna lead. 72 or 75 ohm shielded cable, RCA pin jacks Rosen core solder soldering guns or electric soldering pencils. Plastic wire nuts	2. Identify and describe each cable and explain where it is used. A. Parallel cord - light AC power and switching control, relays, doorbells, alarms, remote speakers. B. 300 ohm twin lead - TV antennas C. 72 or 75 ohm shielded cable - TV cable systems, microphone leads	Listen Take notes
	Sets of male and female threaded connections for shielded cable. Plastic electrical tape. Wire strippers, jack knife, wire cutters	3. Explain and demonstrate how connections are made and protected using each wire. A. Parallel cord	Observe

LESSON PLAN (CONTINUED): 3 UNIT NO. 32 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
		1. Stripping 2. Twist, solder and tape 3. Wire nuts 4. Tin frayed ends and connect under screws (wrap clockwise around screw. B. Antenna twin lead 1. Stripping 2. Solder and tape splice 3. Connect under screws (clockwise) C. Shielded cable 1. Stripping 2. Gathering shield 3. Soldering inner conductor and shield to connections (RCA Jacks) 4. Making solderless connections with threaded parts.	
25	Assignment sheet	4. Assign students to make various aplices and connections using the cable samples, materials and tools 5. Provide individual assistance and supervision	Work in teams of two making and protecting various splices and connections, soldering and taping as necessary

LESSON PLAN

3.B.1.C Electro-Magnetism and Communication Devices
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 3 (NO.) LESSON: 33,34 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.17 (CODE NO.) COMPETENCY VERIFICATION EV 3.15 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to explain the relationship between physical motion, electricity and magnetism and describe the principles of operation of the telegraph, telephone receiver and loud speaker.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
	Galvanometer, large demonstration magnet, flexible conductor, oscilloscope with connecting leads. Telegraph sounder, telephone receiver, loud speaker. Dynamic microphone. Lifting magnet	1. Explain that electricity can cause magnetism by demonstrating an electric lifting magnet.	Listen Observe Take notes
	Loper, Ahr, Clendenning Introduction to Electricity and Electronics	2. Explain that magnetism can cause electricity by demonstrating movement in the demonstration magnetic field of a conductor connected to a galvanometer (Page 215, Figs. 9-2 and 9-3 of resource) 3. Describe the structure of a loud speaker as a coil of wire mounted in a magnetic field and hitched to a movable diaphram. A. Electrical pulses to speaker generate sound	

LESSON PLAN (CONTINUED): 3 UNIT NO. 33,34 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
		B. Sound waves hitting the diaphram generate electricity.	
	Resource Page 129	4. Demonstrate electrical waves generated by whistling in the speaker by connecting speaker leads directly to the oscilloscope	
	Resource Page 129 Fig. 6-24	5. Describe structure and operation of the telephone receiver	
		6. Review structure and operation of telegraph sounder	
	Assignment sheet, Library, World Book Encyclopedia	7. Assign students to write one page reports on the telegraph sounder, the telephone receiver and the loud speaker	Students will gather data, draw labeled diagrams and write reports on these devices
		8. Supervise and provide assistance	

LESSON PLAN

3.B.3 Amplifier Systems
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 3 (NO.) LESSON: 35 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.18 (CODE NO.) COMPETENCY VERIFICATION EV 3.16 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to describe the purpose of communication amplifiers in terms of relative inputs and outputs, frequency, power sources and linearity.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
5	The Basic Book of Electricity and Electronics by Gerald E. Williams (Unit 28, Page 73)	1. Identify common amplifiers by function A. Hi Fi - audio amplifiers B. Radio-TV, CB, - RF amplifiers C. Satellite systems - microwave amplifiers	
	Audio amplifiers, oscilloscopes	2. Explain basic purpose of amplifiers is to control larger amounts of local available power in perfect timing with a small and possibly distant pick up or transmitted signal.	
5		3. Use the oscilloscope to demonstrate the difference between input and output of an audio amplifier	
5		4. Discuss possible sources of power for amplifiers 1. Batteries 2. AC power line rectified to DC (power supply) 3. Mechanical generators or alternators (automobile)	

LESSON PLAN (CONTINUED): 3 UNIT NO. 35 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5		5. Discuss quality of amplifiers as judged by frequency response, distortion, and RMC power rating.	
30	Assignment sheet	6. Assign students to connect an audio amplifier - loud speaker system using the oscilloscope to monitor input and output waveforms. 7. Provide assistance as necessary	Connect audio system and monitor input and output with oscilloscope

LESSON PLAN

3.B.4,5 Radio Transmitting/Receiving
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 3 (NO.) LESSON: 36,37 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.19,3.23 (CODE NO.) COMPETENCY VERIFICATION EV 3.16 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to define the following terms related to radio transmitting: Carrier wave, amplitude modulation, frequency modulation, antenna tower, tuning circuit, detector, audio amplifier and speaker and explain the role of the FCC.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
10	Loper, Ahr, Clendenning, *Introduction to Electricity and Electronics*. Pages 465-466.	1. Use a block function diagram to explain the basic components and functions of a radio transmitting station. Relate to CB car radio or base station A. Microphone B. Oscillator - generates RF carrier wave C. Modulator - Superimposes information on carrier. (1) A.M. (2) F.M.	Listen Take notes
*Use	illustration Fig. 19-18,	Page 465 of Resource D. Conducting lines E. Antenna F. Antenna tower	
5		2. Explain the regulating function of the FCC	

LESSON PLAN (CONTINUED): 3 UNIT NO. 36,37 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10		3. Use a block diagram to describe the necessary components and functions of a basic radio receiver A. Tower/antenna B. Tuning circuit C. Detection D. Audio amplifier E. Speaker	
75	Assignment sheet	4. Assign students to connect and operate a simple radio receiver (crystal detector) in the laboratory	Connect component parts and operate a radio receiver

LESSON PLAN

3.B.6,7,8,9 Modern Electrical Communication Systems
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 3 (NO.) LESSON: 38,39 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.20 (CODE NO.) COMPETENCY VERIFICATION EV 3.17;3.18 3.19;3.20 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to describe the main principles and features of the following communication systems in written reports.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10	Library, World Book Encyclopedia, Resource Center	1. Identify and briefly describe one main application of each of the following communication systems. A. TV - mass entertainment B. Radar - Weather prediction; police work C. Laser and fiber optics - telephone systems	Listen
5	Assignment sheets	2. Assign students to research and report on each of these systems	Research and prepare written reports on the systems
85		3. Provide individual assistance as needed	

LESSON PLAN

3.B.11 Organization of Electrical Communication Enterprise - Careers

(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 3 (NO.) LESSON: 40,41,42 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.22 (CODE NO.) COMPETENCY VERIFICATION EV 3.21 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify job titles and task/functions of personnel in one of the following communication enterprises: TV cable subscriber service, radio broadcasting station, TV broadcasting station, electronic repair and service.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	Dictionary of Occupational Titles	1. Identify local (or the nearest) enterprises which would be most familiar to the students and discuss their operation	Listen Contribute to discussion Take notes
10	Vocational Biographies Electricity and Electronics Careers, Sauk Centre, Minn. 1980	A. Radio station (1) Facilities needed (2) Equipment (3) Personnel (careers)	
10		B. TV station (1) Facilities (2) Equipment (3) Personnel	
10		C. Cable TV Service Co. (1) Facilities (2) Equipment (3) Personnel	
10		D. Electronic repair and service (1) Facilities (2) Equipment (3) Personnel	

LESSON PLAN (CONTINUED): 3 UNIT NO. 40,41,42 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	Assignment sheet	2. Assign students to select one of the enterprises and prepare a personnel organization chart.	Analyze the operation of a selected electrical communication enterprise and prepare a personnel organization chart showing departments, functions, position titles and tasks/duties for each person
		3. Arrange for field trips or interviews if possible or for guest appearance in class	Interview guests or participate in field trip
100		4. Provide assistance as needed	

LIFE ROLE SKILL CODE	COURSE COMP. GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
LRN. 2,5 CON. 1 PRO. 1,3	1	4.9 Describe and analyze the relationship of the profit motive to the rewards for risk taking.	EV 4.1
LRN. 5 PRO. 2,3 CON. 1,2	1	4.10 List with 100% accuracy a variety of sources of funds for financing business enterprises.	EV 4.1
PRO. 1,2 CIT. 1	1	4.11 Identify and discuss in a report the various forms of business organization and the advantages and disadvantages of each.	EV 4.3
PRO. 2,3 CON. 1 IND. 3 CIT. 1,2,3	1,4	4.12 Explain in writing with 90% accuracy the role of competition in the private enterprise system and list its benefits to consumers.	EV 4.1 4.2
LRN. 3 CON. 1 IND. 3 CIT. 1,2	1,2	4.13 Describe the role of savings and investment in capital formation and relate to the teacher's satisfaction its significance to levels of production and economic growth.	EV 4.1
LRN. 5 PRO. 1,2,3 CIT. 1,3	1,2,4,5	4.14 Explain in writing how the advancement of technology increases productivity, benefits the consumer; and stimulated economic growth.	EV 4.1 4.2
LRN. 2 CIT. 1	1,2,3,5	4.15 Distinguish on a written exam with 100% accuracy between the various types of market structures with regard to types of firms, level of competition, types of products, and determination of prices by competitive or noncompetitive processes.	EV 4.1 4.2

LIFE ROLE SKILL CODE	COURSE COMP. GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
CON. 1 PRO. 2 IND. 1,3 CIT. 1	1,3,5	4.16 Explain orally to the teacher's satisfaction the role of prices in allocation of resources, goods, and services	EV 4.1 4.2
LRN. 5 PRO. 1 CIT. 1	1,2,3,5	4.17 Explain in writing with 100% accuracy the relation between price and quantity of goods demanded and supplied.	EV 4.2
PRO. 1,2 CIT. 1	1	4.18 Participate in a class discussion on how the productivity of labor, capital, land, and entrepreneurship helps to determine the incomes to each of the factors of production.	EV 4.2
LRN. 5 CON. 1 PRO. 2 CIT. 1,3	1,2,3	4.19 Describe with 100% accuracy the role of money and the effects on economic activity of decreasing or increasing the quantity of money in a private enterprise economy.	EV 4.1
CON. 2 CIT. 1,2,3	1,3,4	4.20 Discuss several effects of government regulation on consumers and producers in the American economy.	EV 4.1 4.2
CON. 2 CIT. 1,3	1,3	4.21 State in writing the rationale for the federal government's assuming a role in helping to stabilize the economy.	EV 4.2
PRO. 3 CIT. 1	1,2,3	4.22 Explain in a panel discussion how economic specialization promotes foreign trade and world interdependence.	EV 4.2
LRN. 1 CIT. 1,3	1,2,3	4.23 Differentiate in a matching question among traditional, command, market, and mixed economic systems with regards to a. Ownership of property b. distribution of income c. role of government d. economic incentives	EV 4.2

LIFE ROLE SKILL CODE	COURSE COMP. GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
LRN. 1 CIT. 1	1,3	4.24 Describe with 100% accuracy the structure of the Federal Reserve System and list its main functions with regard to monetary policy.	EV 4.1
CIT. 1	1	4.25 State with 100% accuracy what Gross National Product measures.	EV 4.2
CON. 1 CIT. 1	1,3,5	4.26 Describe in class discussion the impact of inflation on the economic decisions of businesses and households.	EV 4.2
CON. 1 PRO. 2 IND. 3 CIT. 1,2,3	1,3	4.27 Explain in a brief paper how the federal government's taxation and expenditures policies affect inflation and employment.	EV 4.4

LIFE ROLE SKILL CODE	COURSE COMP. GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
		UNIT 5 Manufacturing (Free Enterprise Simulation)	
LRN. 4,5	1,3,6	5.1. Students will be able to discuss and explain the function of role playing in the learning process as it relates to them individually and the class as a whole and be willing to freely participate in this learning activity. Degree of achievement in this activity will be evaluated by instructor observation of participation and student self rating scale.	EV 5.1
LRN. 5 CIT. 1,2,3	1	5.2. Students will be able to answer questions regarding the formation of a corporation, the functions of stock holders and corporate officers and the manner in which overall policy is established and approved (charter granted) with 80% accuracy.	EV 5.2
LRN. 4,5	1,3	5.3. Students will be able to identify at least 3 of the factors which are considered in the process of selecting a product to be manufactured.	EV 5.2
LRN. 4,5	1,3	5.4. Students will be able to identify at least 2 ways of accumulating capital for corporate operation.	EV 5.2
LRN. 3,5	2,3,6	5.5. Students will be able to make, interpret, or modify working drawings of a product to the satisfaction of the instructor and fellow workers. Competency will be judged by performance	EV 5.3

LIFE ROLE SKILL CODE	COURSE COMP. GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
		on at least one drawing assignment related to the product and the satisfactory performance of a production role following the approved plans.	
LRN. 1,5	2,3	5.6. Students will be able to identify a logical sequence of operations needed to produce a simple product when asked to do so on a written test.	EV 5.4
LRN. 1,2	2,3	5.7. Students will be able to describe the contributions of the concepts of interchangeable parts, the assembly line, material and product flow, division of labor quality control and jigs and fixtures to the mass production operation on a written test.	EV 5.4
LRN. 4,5	2	5.8. Students will be able to perform manipulative production operations as assigned in the production simulation. Performance will be checked by students assigned to quality control and checked by observation to the satisfaction of instructor.	EV 5.5
LRN. 1,2 CIT. 1	1,6	5.9. Students will be able to identify the normal functions of a labor union associated with a production enterprise.	EV 5.4
LRN. 2,3,5 PRO. 1	1,2,5,6	5.10. Students will be able to perform the usual functions of a retail salesperson, presenting the sales opportunity, collecting and	EV 5.5

Section VII
Unit Performance Objectives and Evaluation Criteria (Cont. Table IV)

LIFE ROLE SKILL CODE	COURSE COMP. GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
		accounting for money, arranging for pick up or delivery. Competence will be evaluated from student sales reports and observations of instructor.	
LRN. 3,4,5 CIT. 1	1	5.11. Students will be able to identify at least two ways in which a corporation is terminated on a written test.	EV 5.4
		UNIT 6 Construction	
LRN. 1,2,4	3	6.1 Students will be able to define construction, distinguish the field from manufacturing and identify 4 different kinds of structures that are constructed on a written test.	EV 6.1
LRN. 1,4	2,3	6.2 Students will be able to answer questions regarding the point of view and basic content of each of the following parts of structural drawings: plans, elevations, sections and details, specifications, contours, and topographical maps with 80% accuracy.	EV 6.1
LRN. 1,3,4	2,3	6.3 Students will be able to interpret scaled distances from structural drawings given a ruler or scale under usual testing conditions with 90% accuracy.	EV 6.2
LRN. 1,2,4 CIT. 1 IND. 1	1,4	6.4 Students will be able to match the usual responsibilities of each of the following with a description of their roles in constrution: client/customer, architect, general contractors, skilled tradespeople, equipment operators, laborers, with 90% accuracy on a written test.	EV 6.3

Unit Performance Objectives and Evaluation Criteria (Cont. Table IV)

LIFE ROLE SKILL CODE	COURSE COMP. GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
LRN. 1,2,4	2,5	6.5 Students will be able to recognize/define/interpret the words commonly used in conversation and writing regarding construction to identify structural components and members, systems and sub-systems, and/or functions with 70% accuracy on an objective test.	EV 6.4
LRN. 2	2,5,6	6.6 Students will be able to describe the operation of a home sanitary sewer-septic system including the functions of vents, traps, septic tanks, distribution box and field lines. Achievement will be demonstrated by a written research paper describing the functions: understanding vocabulary terms will be included in EV 6.4.	EV 6.4 6.5
LRN. 1,3,5	3	6.7 Given a set of working drawings and specifications for a small tool shed, students will be able to answer questions regarding the overall size of the building, the size of the access door, the maximum amount of interior head room, the materials used for floors, walls, roof and the location of electrical switches and lights with 80% accuracy.	EV 6.6
LRN. 1,2,3, 4,5 CON. 1	2,3,5	6.8 Given the plans and specifications for a small building the students will be able to estimate amounts of raw materials needed to build it, find, retain sources of supply in the local market area, and estimate the costs of the raw materials.	EV 6.7

LIFE ROLE SKILL CODE	COURSE COMP. GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
		Achievement will be demonstrated by successful completion of an assignment sheet acceptable to the instructor.	
LRN. 1 CIT. 2 CON. 2	1,5	6.9 Students will be able to describe the purpose of construction contracts, identify the most common clauses, and answer questions requiring the interpretation of a contract which they are given to read.	EV 6.8
LRN. 4,5 PRO. 1 IND. 1	6,2	6.10 Under direct supervision of an instructor and with the assistance of fellow students, students will be able to safely perform the elementary construction operations of measuring and layout, sawing with a hand saw and/or portable electric saw, drilling or boring by hand or portable electric drill, structural placement, holding and fastening using nails. Competency will be verified by a check-off sheet identifying those operations actually performed at least once by the student during construction of the group project.	EV 6.9
LRN. 1,2	4	6.11 Students will be able to describe the training and working conditions of construction tradesmen in a written report.	EV 6.10

LIFE ROLE SKILL CODE	COURSE COMP. GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
LRN. 1,5	3,5	UNIT 7 ENERGY, POWER AND TRANSPORTATION 7.1 Students will be able to recognize the technical terms and concepts used to describe, measure, or explain principles, mechanisms, and systems associated with energy and power control with 80% accuracy on an objective test.	EV 7.1
LRN. 2,3,5	2,3	7.2 Students will be able to explain how hydraulic - pneumatic systems can increase mechanical force, describing the functions of the drive piston/cylinder or pump, valves, the driven cylinder/piston and the high pressure lines when asked to do so in a written exercise.	EV 7.2
LRN. 2,5	2,3	7.3 Students will be able to identify building and automobile jacks, hoists, vehicle brakes, and earth moving equipment as major applications of hydraulic - pneumatic principles when asked to do so on a written exercise.	EV 7.2
LRN. 2	2	7.4 Students will be able to explain the energy conversions which trace wind, water, and combustion fuel sources back to the sun as an ultimate source/cause, when asked to do so on a written exercise.	EV 7.3
LRN. 2 CON. 1	2,3	7.5 Students will be able to identify the function of the various parts of a passive solar hot water heater for a domestic home when asked to do so on a written exercise.	EV 7.4

Section VII
Unit Performance Objectives and Evaluation Criteria (Cont. Table IV)

LIFE ROLE SKILL CODE	COURSE COMP. GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
LRN. 2	2,3	7.6 Students will be able to identify at least two applications of wind power and describe the system used to develop wind power in each case.	EV 7.5
LRN. 1,2,4	1,2,3	7.7 Students will be able to identify the functions of the following components of a water based energy system; weather, streams/rivers, dams, wheels and turbines, gates, electrical generators when asked to do so on a written exercise.	EV 7.5
CON. 1 IND. 1	2,3,5	7.8 Students will be able to answer questions regarding the safe combustion of fuel (solid or liquid) in domestic homes for direct heat and light with 80% accuracy.	EV 7.6
LRN. 1	2	7.9 Students will be able to identify the function of each of the following components of a steam based power system: Fuel-fire box, heat exchanger-boiler, lines and manifolds, turbines, condensor, return pump, and generator, when asked to do so on a matching quiz with 80% accuracy.	EV 7.7
LRN. 1	2	7.10 Students will be able to associate the name of each of four stroke cycles of an internal combustion engine with a brief description of that cycle when asked to do so on a matching quiz with 80% accuracy.	EV 7.7

LIFE ROLE SKILL CODE	COURSE COMP GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
LRN. 1	2	7.11 Students will be able to match the names of the main parts of an internal combustion engine with brief descriptions of the functions of those parts when asked to do so on a matching quiz with 80% accuracy.	EV 7.7
LRN. 5	3,4	7.12 Students will be able to perform the following services to a small internal combustion engine; change oil, change/clean spark plug, change/clean air filter, and adjust idle speed. Ability will be verified on check off assignment sheet by instructor following student performance of these operations, working in groups of two or three.	EV 7.8
LRN. 2 IND. 1 CON. 1	2,5	7.13 Students will be able to recognize the main components of the commercial electrical power distribution system serving their neighborhood, and describe their main purpose or function. Competency will be demonstrated by completion of an assignment sheet requiring the precise location of one example of each component in their neighborhood and a written description of functions, acceptable to the instructor.	EV 7.9
IND. 1	6	7.14 Students will be able to answer questions regarding electrical safety in the home and shop with 100% accuracy.	EV 7.10

LIFE ROLE SKILL CODE	COURSE COMP. GOAL NO.	UNIT PERFORMANCE OBJECTIVES	EVAL INSTRUMENT CODE
LRN. 1,4	1,2	7.15 Students will be able to identify at least one advantage and at least one disadvantage or problem associated with each of the following modes of transportation; railroads, automobiles, buses, boats, and airplanes when asked to do so on a written test.	EV 7.11
LRN. 5	2	7.16 Students will be able to answer questions regarding the principles of operation and propulsion of air, land, sea and space vehicles with 80% accuracy.	EV 7.11
LRN. 1,2 PRO. 1	4	7.17 Students will be able to identify and describe a career associated with energy/power/transportation which would be capable of entering in terms of initial training, main tasks/responsibilities, working conditions, and life style. Competency will be verified by submission of a written report acceptable to the instructor.	EV 7.12
LRN. 3,5	3	7.18 Students will be able to define and measure electrical quantities with a multimeter as exhibited by a laboratory report.	EV 7.13

SECTION VIII

DETAILED UNIT PLANS

The complete unit plans for each of the seven units of the course are presented in this section. Each unit will be organized in the following order:

1. Detailed unit topical outline
2. Unit performance objectives
3. Detailed lesson plans keyed to the UPO's and the outline
4. Assignment and evaluation sheets which are not teacher generated locally
5. Resources

This presentation includes a major expansion of the topical outline of Table III and repetition of information from Table IV. However, it does present all information pertinent to preparation for teaching within each unit.

Teachers are expected to develop many assignment sheets which fit the local situation.

INSTRUCTIONAL PLAN

UNIT ONE

1	Introduction to the Course	1 week total
	A. Course requirements	1/2 day
	B. Tour of facilities	1/2 day
	C. Administrative details	1/2 day
	1. Text books	
	2. Locker assignment	
	3. Parents permission to operate hazardous machines, etc.	
	D. General safety rules	1 1/2 days
	1. Behavior expectations	
	2. Eye protection	
	3. Unauthorized use of tools or equipment	
	4. Accident reporting	
	5. Emergency procedures	
	6. Situations unique to the school	
	E. Student personnel system	3 days
	1. Role playing titles	
	2. Task descriptions	
	3. Assignment or election of students to responsible positions	
	4. Practice in industrial roles - production of a "T" square with drawing board	
	a. Review of product plans	
	b. Survey of production work stations and operations	
	c. Assignment of students to tasks	
	d. Evaluation discussion	

UNIT PERFORMANCE OBJECTIVES

UNIT ONE

UNIT PERFORMANCE OBJECTIVES		EVAL INSTRUMENT CODE
UNIT 1.	INTRODUCTION TO THE COURSE	
1.1	Students will be able to identify the specific graduation requirements that can be met by successful completion of this course on written test.	EV 1.1
1.2	Students will be able to identify five of the seven major topics of the course on a written test	EV 1.1
1.3	Students will be able to explain the reason for each of the major safety rules associated with laboratory participation on a written test with 100% accuracy.	EV 1.1
1.4	Students will participate in role playing tasks associated with laboratory management and industrial simulation by being able to identify their individual role at any time. Degree of cooperation and leader/followership skills to be evaluated by rating scales.	EV 1.2

LESSON PLAN

1 A,B Intro to the Course, Requirements, Facilities
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 1 (NO.) LESSON: 1 (NO.) UNIT PERFORMANCE OBJECTIVE: 1.1,2 (CODE NO.) COMPETENCY VERIFICATION EV 1.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Introduce students to the course so that they can identify graduation requirements which will be met and identify the content which will be studied in the various units, and be familiar with the facilities.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	 STUDENTS
15	Chalk board or overhead transparency and hand out sheets. Local school graduation requirements.	1. Present major requirements for graduation - lecture A. Carnegie Units B. Life role competencies to be achieved (1) Learner (2) Individual (3) Citizen (4) Producer C. Understandings regarding principles of career development and business/economics/free enterprise. D. Carnegie Units by areas. 2. Explain how completion of the course will earn a Carnegie Unit and reinforce life role competencies.	Listen Take notes Ask questions Respond to verbal questions

LESSON PLAN (CONTINUED):

UNIT NO. 1

LESSON NO. 1

PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
15	Course description or syllabus developed locally identifying course competency goals, major unit topics and student requirements.	3. Present the 7 major unit topics of the course A. Describe content and activities planned for each unit. B. Explain how understandings regarding career development and principles of business/free enterprise will be presented as single units and then integrated throughout course.	
15	Access to the laboratory	4. Conduct tour of laboratory facilities. A. Major areas B. Equipment names and gross functions C. Special hazards	Observe Listen
5		5. Ask review questions Clarify understanding A. What specific graduation requirements can be met by this course? B. What are the major units of the course?	Answer questions Listen

LESSON PLAN

1 C,D Adminstrative Details, General Safety
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 1 (NO.) LESSON: 2 (NO.) UNIT PERFORMANCE OBJECTIVE: 1.3 (CODE NO.) COMPETENCY VERIFICATION EV 1.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to follow required administrative procedures, obtain parents permission to operate hazardous equipment and explain reasons for major safety rules.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	 STUDENTS
20	Chalk board or overhead projector. Materials for distribution. Texts Locker assignment sheets Parents permission to operate hazardous equipment sheet. (Appendix 2)	1. Explain administrative procedures A. Assign lockers or storage spaces B. Distribute texts C. Distribute and explain parents permission slips	Listen Receive materials Obtain authorizing signatures and return slip to teacher next day.
20	Information sheet containing major safety rules developed for the local situation.	2. Distribute Safety Rules and explain the hazards and reasons for the rules A. Provisions for safety glasses and sanitary procedures. B. Behavioral expectations C. Accident reporting D. Unauthorized use of equipment/facilities E. Emergency procedures F. Specific local rules	Listen Ask questions Take notes

LESSON PLAN (CONTINUED):

UNIT NO. 1

LESSON NO. 2

PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
10	Assignment sheet requiring written reasons for safety rules.	3. Review questions and distribution of assignment sheet.	Answer questions Complete written homework assignment
		4. Announce quiz second day	Prepare for quiz

LESSON PLAN

1 E Student Personnel System
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 1 (NO.) LESSON: 3 (NO.) UNIT PERFORMANCE OBJECTIVE: 1.4 (CODE NO.) COMPETENCY VERIFICATION EV 1.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to explain the purpose of role playing and fulfill their role in a student personnel system for the class.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	Typical personnel chart	1. Explain general organization of work in industry in terms of position titles and responsibilities. 2. Explain the function of role playing as a learning activity.	Listen
10	Specific student personnel chart developed for this class.	3. Identify the specific job titles and functions needed in the local class student personnel system. 4. Explain rotation system	
30		5. Supervise election of students to positions.	Participate in election
5		6. Review by asking selected students to identify and describe their title and duties.	Respond to questions Listen

LESSON PLAN

1.E.4. Practice in Performance of Simulated Production Roles
(TOPICAL OUTLINE CODE NO. AND TITLE)

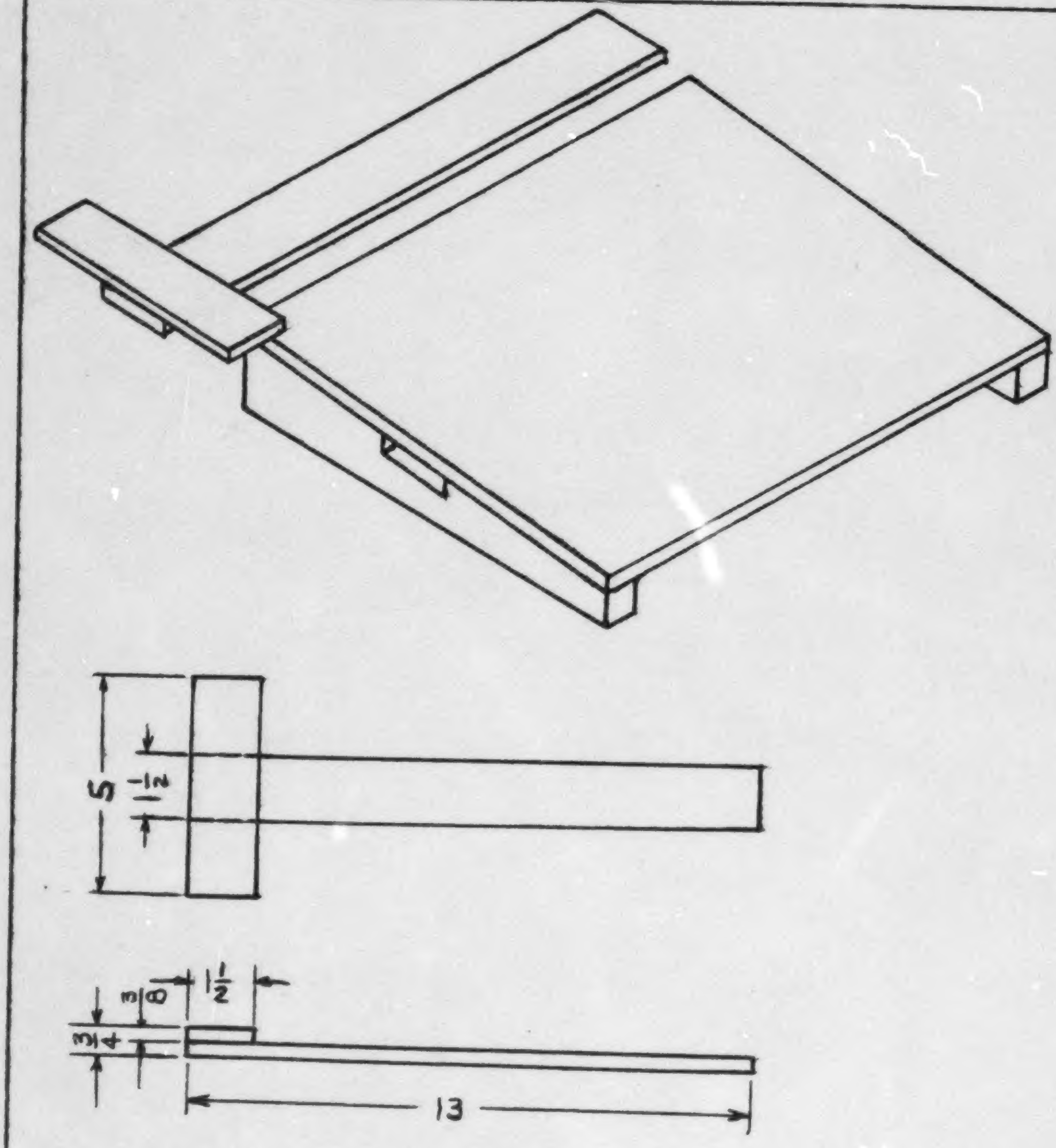
PAGE 1 OF 1

UNIT: 1 (NO.) LESSON: 4,5 (NO.) UNIT PERFORMANCE OBJECTIVE: 1.4 (CODE NO.) COMPETENCY VERIFICATION EV 1.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to apply role playing learning methods to the problem of mass producing a drawing board with "T" square.

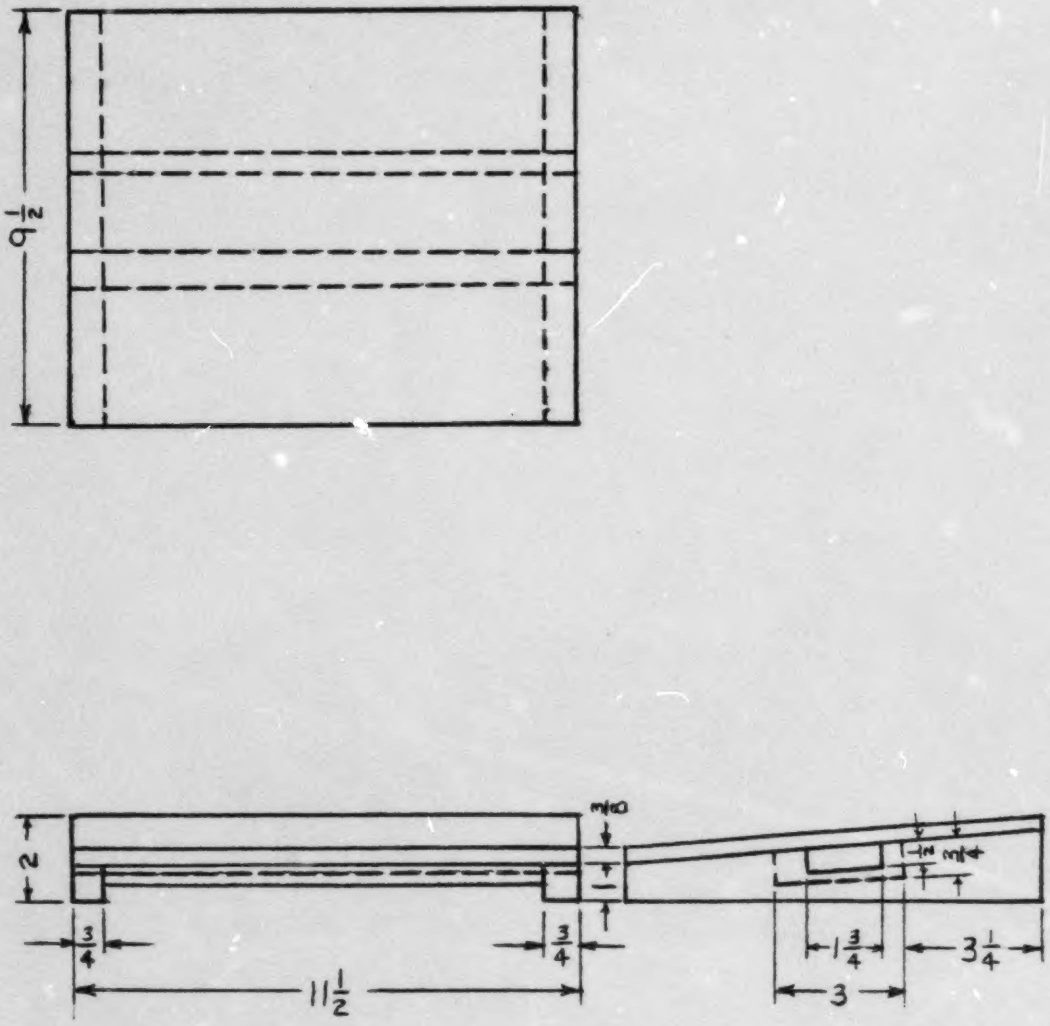
TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
5	Sample of finished "T" square and drawing board, (teacher constructed). Raw materials for producing enough products for every class member. Special set-ups on wood working machinery and hand tools (teacher prepared).	1. Show the sample drawing board to increase motiviation	Observe Listen
10	Working drawings of product (follows this lesson plan)	2. Explain interpretation of working drawings.	
15		3. Lead a tour of the set-up work stations explaining and demonstrating the various operations with safety considerations.	Observe
10		4. Assign students to roles and tasks.	
50		5. Supervise production operation directing student officials.	Perform production operations
10		6. Lead summary discussion	Participate in discussion

NAME ______________________ DATE ______________



MATERIAL:	
ORDER NO.	QUANTITY
T-SQUARE AND BOARD	1 of 2

NAME ______________________ DATE ______________



MATERIAL:	
ORDER NO.	QUANTITY
T-SQUARE AND BOARD	2 of 2

LESSON PLAN

1 C,D Review and evaluation of major safety rules and intro information
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 1 (NO.) LESSON: 6 (NO.) UNIT PERFORMANCE OBJECTIVE: 1.1,2,3 (CODE NO.) COMPETENCY VERIFICATION EV 1.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Review introduction to the course and safety rules and enable students to verify competencies.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
15		1. Receive homework sheets	Submit homework completed Listen Respond to questions
	Previously distributed information and homework sheets	2. Ask oral review questions regarding safety rules 3. Ask oral review questions regarding content and purpose of the course.	
35	Evaluation sheet 1.1	4 Administer competency verification test 1.1	Write answers to test questions

(EV 1.1)

NAME: ____________________ DATE: __________ SCORE: ________

INSTRUCTIONS:

In the space provided answer the following questions using complete sentences.

UPO 1.1

1. Identify the five (5) life role skill areas in which students must develop competency in order to receive a high school graduation diploma in Georgia.

    1. ____

    2. ____

    3. ____

    4. ____

    5. ____

2. List the two additional graduation requirements that can be met by students who complete this entire industrial arts course.

    1. ____

    2. ____

UPO 1.2

This industrial arts course consists of seven (7) major topics. Identify five (5) of these topics.

1. ____

2. ____

3. ____

4. ____

5. ____

UPO 1.3 General Safety

INSTRUCTIONS:

In the space provided explain the reason for each of the major safety rules listed below. Answers must be given in complete sentences.

1. Expected behavior ____

____

2. Eye protection ____

____

3. Unauthorized use of tools and/or equipment ________________

____

4. Reporting of accidents ________________________________

____

5. Emergency procedures __________________________________

____

(EV 1.2)
UPO 1.4

NAME: ____________________ INDUSTRIAL ARTS EVALUATION FORM

CLASS PERIOD ______________ GRADING PERIOD ______________

	MAX. PTS.	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	SIX WEEK AVG.
WORK ATTITUDE	15							
NEATNESS & ACCURACY OF WORK	10							
ROLE PERFORMANCE	10							
ON TASK	10							
GENERAL LAB SAFETY	15							
TOOL USE & SAFETY	15							
ABILITY TO WORK WITH OTHERS	10							
KNOWLEDGE OF SUBJET MATTER*	15							
TOTAL	100							

*Based on test scores

Six Weeks Grade: _____

REMARKS:

Week 1: ______________________________

Week 2: ______________________________

Week 3: ______________________________

Week 4: ______________________________

Week 5: ______________________________

Week 6: ______________________________

INSTRUCTIONAL PLAN

UNIT TWO

2	Career Planning	4 weeks total
	A. Exploring the world of work 1. U.S.O.E. career clusters 2. *Dictionary of Occupational Titles* 3. *Occupational Outlook Handbook* 4. Other sources of occupational information available locally 5. Rights and responsibilities of workers	2 days
	B. Career decision making and planning 1. Factors affecting career choices a. Aptitudes and abilities b. Culture - values and expectations c. Job satisfaction d. Indicators of success 2. Logical decision making a. Organization of information b. Validity of sources 3. Life-time career patterns a. Job advancement possibilities b. Retraining-certification renewal needs c. Risks - long range security vs. short term benefits	3 days
	C. Self understanding of abilities, attitudes and interests 1. Measurement of aptitudes and personality traits 2. Personal examination of values, abilities, goals 3. Relationships between life styles and careers 4. Tentative career choices	5 days
	D. Career entry skills 1. Personal resume 2. Job application forms 3. Use of telephone 4. Interviews a. Dress-grooming b. Manners c. Attitudes conveyed d. Questions to ask E. Tact	10 days

2 Career Planning (Cont.)

5. Letters of inquiry or application
6. Sources of assistance
    a. Georgia Employment Service
    b. Private employment agencies
    c. Newspapers
    d. School related services
    e. Parents, friends, relatives

UNIT PERFORMANCE OBJECTIVES

UNIT TWO

UNIT PERFORMANCE OBJECTIVES		EVAL INSTRUMENT CODE
UNIT 2.	CAREER PLANNING	
2.1	Students will be able to identify at least one source of information regarding the description of tasks, working conditions, and employment outlook of an occupation of interest, on a written test.	EV 2.1
2.2	Students will be able to identify at least three valid reasons for working (engaging in paid employment) in american society on a written test.	EV 2.1
2.3	Students will be able to identify at least three valid expectations (rights) of workers in the american economy on a written test.	EV 2.1
2.4	Students will be able to identify at least three valid expectations that employers have of their workers in the american economy on a written test.	EV 2.1
2.5	Students will be able to describe the life time career pattern of at least one occupation in a written report including initial training, job titles, and tasks performed, advancement training and positions and occupational outlook in the field. Report will be evaluated by the instructor for accurate and logical grammar and thought organization.	EV 2.2
2.6	Students will demonstrate their understanding of the terms and relationships among the concepts of aptitudes, abilities, cultural values, indicators of job success and logical career decision by selecting the best responses to multible choice test items with 70% accuracy.	EV 2.3
2.7	Students will be able to identify at least five occupations in which they have personal interest, aptitude, and ability to succeed. They will briefly identify and describe these occupations on a written report.	EV 2.4

UNIT PERFORMANCE OBJECTIVES

UNIT 2. CAREER PLANNING (CONT.)

2.8	Students will be able to describe in a written report the life-time career patterns of work and training of two different occupations in which they have the aptitude and ability to succeed.	EV 2.5
2.9	Students will be able to interpret job application forms and provide the information requested in a readable manner. Performance will be demonstrated on actual copies of typical employment forms from local companies in a role playing situation. Acceptability will be evaluated by the teacher.	EV 2.6
2.10	Students will be able to prepare a resume of experiences suitable for seeking a job. Resume will be free of grammatical and spelling errors.	EV 2.7
2.11	Students will be able to use the telephone to contact possible employers regarding a position. Achievement will be assumed from successful completion of an assignment sheet requiring use of phone book listing and yellow pages.	EV 2.8
2.12	Students will be able to control their personal behavior and appearance in an acceptable manner while role playing in a simulated job interview. Achievement to be recorded on an observation rating scale.	EV 2.9
2.13	Students will be able to compose a letter of inquiry concerning a possible job. Letter should (1) contain sources of information, (2) exhibit some understanding of the nature of the position and the willingness and ability of the individual to perform that work, (3) provide necessary information for the prospective employer to contact the individual, and (4) be readable and relatively free of grammatical and spelling errors.	EV 2.10
2.14	Students will be able to identify at least three sources of information when seeking employment (on a written quiz).	EV 2.1

LESSON PLAN

2.A. 1-4 Exploring the World of Work - Sources of Information
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 2 (NO.) LESSON: 1 (NO.) UNIT PERFORMANCE OBJECTIVE: 2.1 (CODE NO.) COMPETENCY VERIFICATION EV 2.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify publication titles and how to access career information in the local school system.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10	Succeeding in the World of Work Page 93 to 112 Chalk Board Overhead transparency and/or handout	1. Present USOE Cluster of Careers as major divisions of the work force	Listen Take notes
10		2. Introduce students to sources of information in local school. A. Dictionary of Occupational Titles (DOT) B. Occupational Outlook Handbook C. Guidance office/career center, or local library.	
	Filmstrip: Livelyhoods: Careers for Your Life-styles.	3. Introduce filmstrip and show it.	View filmstrip Listen
	Assignment sheet	4. Ask summarizing questions and make assignments.	Answer verbal questions Listen Complete homework assignment sheet requiring a search to find the DOT code numbers for five occupations common to the school area.

LESSON PLAN

2.A.5 Rights and Responsibilities of Workers
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 2 (NO.) LESSON: 2 (NO.) UNIT PERFORMANCE OBJECTIVE: 2.2,3,4 (CODE NO.) COMPETENCY VERIFICATION EV 2.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify reasons for working, expectations of employers, and rights of workers.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
45		1. Conduct class discussions on the following topics, summarizing conclusions on on the chalkboard. A. Why do people work? B. What do employers expect of workers? C. What should workers expect of their employees?	Listen Participate in discussion Record conclusions
5	Chapter 4, Pages 51 to 64, Succeeding in the World of Work	2. Make reading assignment	Read assignment Prepare written responses to question #3 and #6, Page 64 of Resource

LESSON PLAN

2.B.1 Factors Affecting Career Choices
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 2 (NO.) LESSON: 3 (NO.) UNIT PERFORMANCE OBJECTIVE: 2.5,6 (CODE NO.) COMPETENCY VERIFICATION EV 2.3;2.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to explain the relationship between the concepts of aptitudes, values, abilities, and personal goals and logical career decisions.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
40	Chapter 5, Succeeding in the World of Work, pages 66 to 84 Chalk board/overhead projector	1. Define the following terms and show their relationship to logical career decisions A. Aptitude B. Ability C. Personal values D. Personal goals E. Personality traits F. Cultural values and expectations	Listen Take notes Answer verbal questions
10	Assignment sheet Required reading (Chapter 5) and writing	2. Make assignment, answer question 1	Read assignment Complete written assignment requiring self evaluation of the student's own abilities, aptitudes, values and personal traits. At least one sentence per term.

LESSON PLAN

2.B.2 Logical Decision Making - Researching Careers
(TOPICAL OUTLINE CODE NO. AND TITLE)
PAGE 1 OF 1

UNIT: 2 (NO.) LESSON: 4 (NO.) UNIT PERFORMANCE OBJECTIVE: 2.5,6 (CODE NO.) COMPETENCY VERIFICATION EV 2.2; 2.3 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to find career information sources and gather information to prepare a written report of findings.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
10	Succeeding in the World of Work, Chapter 6, Pages 85 to 92.	1. Make long range assignment Provide report guidelines.	Listen Ask questions
40	Assignment sheet	2. Supervise and assist students in finding sources and gathering information.	Gather data for a paper describing the life time career pattern of an occupation including initial training, job titles, tasks performed, advancement, and occupational outlook in the field.

LESSON PLAN

2.B.3 Lifetime Career Patterns - Student Reports
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 2 (NO.) LESSON: 5 (NO.) UNIT PERFORMANCE OBJECTIVE: 2.5,6 (CODE NO.) COMPETENCY VERIFICATION EV 2.2; 2.3 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to organize career data gathered in previous session into a formal written report.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
15	Notes of selected students from previous day's session. Chalk board/overhead projector.	1. Ask selected students to orally present information they have gathered.	Orally report or Listen Ask questions
15	Research paper Assignment sheet	2. Show how student gathered data can be organized into logical paragraphs of information with good sentence structure.	Listen Respond to questions
20		3. Assign students to start a rough draft of their final report. Assist individuals as needed.	Listen Begin composing rough draft Ask for assistance if needed
		4. Assign final draft of report as homework	

LESSON PLAN

2.C Self Understanding of Aptitudes and Abilities
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 2 (NO.) LESSON: 6 & 7 (NO.) UNIT PERFORMANCE OBJECTIVE: 2.6,7,8 (CODE NO.) COMPETENCY VERIFICATION EV 2.3; 2.4; 2.5 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will complete procedures to measure their own interests and abilities and be able to interpret the results.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
50	Windefordner, David W. *Career Decision Making*; *Activities Guide for Career Decision Making*. Page 4	1. Discussion of activities A, B, C, D, E, pages 197 - 223, *Career Decision Making*	Listen Read
	Distribute copies of rating scales and check lists Page 15 of *Activities Guide*.	2. Direct students to complete Aptitude Self-Estimate Record	Listen Read Record estimated aptitudes
	Check list on Page 9 of *Activities Guide*	3. Direct students to fill out Work Activity	Circle responses describing feelings about working in occupations involving various activities
50	Page 12 of *Activities Guide*	4. Direct students to complete rating sheet indicating preferences for various work situations.	Circle rating descriptions
	Windefordner, David, *Worker-Trait Group Guide*.	5. Demonstrate proper use of the Worker-Trait Group Keysort Deck.	Listen
	Worker-Trait Group Keysort Deck.	6. Supervise students in use of Worker Keysort Deck.	Record results from use of Deck

LESSON PLAN

2.C.3-4 Relationships and Tentative Career Choices
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 2 (NO.) LESSON: 8 & 9 (NO.) UNIT PERFORMANCE OBJECTIVE: 2.7,8 (CODE NO.) COMPETENCY VERIFICATION EV 2.3; 2.4 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify, at least five occupations in which they have the necessary aptitudes and abilities to succeed, and will make a primary and secondary career choice.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	Winefordner, David Worker Trait Group Guide.	1. Review relationships between worker-trait groups and career clusters.	Listen
30	Assignment sheet	2. Direct students to identify and briefly describe five occupations in which they could succeed using assignment sheet as a recording guideline.	Gather information Compose written reports on the five occupations
5	Assignment sheet	3. Assign students to make a teacher primary and secondary career choice and to prepare a formal career exploration survey of each of these choices.	Listen
60		4. Assist and supervise students in gathering data and composing reports.	Compose written surveys of primary and secondary career choices.

LESSON PLAN

2.A,B,C Review and Competency Verification
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1
EV

UNIT: 2 (NO.) LESSON: 10 (NO.) UNIT PERFORMANCE OBJECTIVE: 2.1-8 (CODE NO.) COMPETENCY VERIFICATION 2.1-2.5 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will submit all reports, evaluation sheets and test papers for recording of competencies and grade determination purposes.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
10	Blank copies of assignment sheets and EV sheets 2.1-2.5	1. Collect reports, rating sheets and other assignments not already turned in.	Submit assignments
30		2. Administer test, EV 2.3	Respond to test items
10		3. Review test items	Ask questions

LESSON PLAN

2.D.2 Career Entry Skills - Job Application Forms
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 2 (NO.) LESSON: 11 (NO.) UNIT PERFORMANCE OBJECTIVE: 2.9 (CODE NO.) COMPETENCY VERIFICATION EV 2.6 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to interpret job application forms and provide the requested information in a readable manner.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	Job application forms from two local employers	1. Describe procedure for applying for a job.	Listen
5	Overhead projector	2. Distribute application forms.	Receive
10	Kimbrell and Vineyard, Succeeding in the World of Work, Chapter 3.	3. Present the 10 suggestions for filling out job application forms, (page 30 of reference)	Listen Take notes
25		4. Direct students and provide assistance in filling out forms of one employer	Fill out application form - ask questions
5		5. Assign students to fill out form of other employer as homework.	Fill out application form at home.

LESSON PLAN

2.D.1 Resume Preparation
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 2 (NO.) LESSON: 11A (NO.) UNIT PERFORMANCE OBJECTIVE: 2.10 (CODE NO.) COMPETENCY VERIFICATION EV 2.7 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to prepare a personal resume of experiences suitable for job seeking purposes.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	Kimbrell and Vineyard, *Succeeding in the World of Work*. Pages 36-37.	1. Describe the purpose of the resume.	Listen
5	Assignment sheet	2. Distribute example	
5	Completed example	3. Identify major divisions of information (page 37)	Listen Take notes
30	Resume	4. Distribute assignment sheet Assign the preparation of the student's personal resume.	Compose draft of resume following assignment sheet
		5. Assist students in preparation of a rough draft.	
5		6. Assign final resume preparation as homework	Prepare final resume
		7. Assign reading from reference, Chapter 3	Read

LESSON PLAN

2.D.3 Job Entry Skills - Use of Telephone
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 2 (NO.) LESSON: 12 (NO.) UNIT PERFORMANCE OBJECTIVE: 2.11 (CODE NO.) COMPETENCY VERIFICATION EV 2.8 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to use the telephone to contact employers regarding a job and exhibit acceptable telephone etiquette.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	Telephone books of local area.	1. Describe organization of local telephone book A. Geographical areas B. Alphabetical listing C. Yellow pages	Listen
10		2. Describe common telephone etiquette. A. Determine if the right company was reached. B. Identify yourself C. Identify your purpose D. Remember name of person company receptionist refers you to E. Identify yourself and purpose again F. Answer questions G. Record vital information (1) Call back numbers (2) Dates/time of interview (3) Procedures to enter plant (4) Name of contact (5) Travel directions if necessary H. Conclude call politely	

LESSON PLAN (CONTINUED):

2 UNIT NO.

12 LESSON NO.

PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	PRESENTATION AND LEARNING ACTIVITIES STUDENTS
5		3. Voice/personality A. Speak clearly into mouth piece B. Use correct grammar C. Use please, thank you, Sir, etc. D. Eliminate background noise - distractions - TV, jude box, bowling pins, etc.	
25	Three disconnected desk set telephones	4. Role play with selected students where teacher is prospective employer and student is job seeker wanting an interview. Second student is telephone receptionist for company. Repeat several times with different students.	Role play or watch/listen Critique behavior
5	Assignment sheets	5. Make assignments	Complete assignment sheet requiring use of telephone listing and yellow pages

LESSON PLAN

2.D.3 Career Entry Skills - Interviews
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 2 (NO.) LESSON: 13 (NO.) UNIT PERFORMANCE OBJECTIVE: 2.10 (CODE NO.) COMPETENCY VERIFICATION EV 2.9 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to explain the purpose of interviews in a job interview situation, and prepare themselves to role play interview situations.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10	Kimbrell and Vineyard Succeeding in the World of Work, Pages 37-46.	1. Explain purpose of interviews. A. Determine facts about job seeker B. Clarify job tasks and expectations. C. Screen job seekers	Listen Take notes
15		2. Identify and discuss questions most often asked (Page 42)	
15		3. Explain how to prepare for the interview	
5	Assignment sheet	4. Assign preparation for role playing interviews	Seek preliminary information about a local employer
5		5. Assign reading in Reference Pages 37-46	Read

LESSON PLAN

2.D.3 Career Entry Skills - Interview Role Playing
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 2 (NO.) LESSON: 14 (NO.) UNIT PERFORMANCE OBJECTIVE: 2.10 (CODE NO.) COMPETENCY VERIFICATION EV 2.9 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to prepare for interviews and successfully complete them.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10	Desk/office/interview chair arrangement	1. Teacher acts as prospective employer and role plays an interview with selected student.	Role play or listen/observe
5		2. Lead critique discussion of performance A. Positive behaviors B. Negative actions	Participate in discussion
10		3. Repeat role playing with second student	Role play/observe
5		4. Ask selected student to lead critique	Discussion
10	Kimbrell and Vineyard Succeeding in the World of Work	5. Review "48 Reasons why People are not Hired" (Page 44 of Resource)	Listen
5	Assignment sheet (use local firms as employer models)	6. Assign selected students to act as prospective employers for following days role playing.	Listen Prepare for employer role
5	Assignment sheet	7. Assign remaining students to seek the available jobs through interviews in a competitive market	Listen Prepare for job seeking role

LESSON PLAN

2.D.3 Career Entry Skills - Interview Role Playing
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 2 (NO.) LESSON: 15 (NO.) UNIT PERFORMANCE OBJECTIVE: 2.10 (CODE NO.) COMPETENCY VERIFICATION EV 2.9 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to control their behavior in simulated interview roles.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
40		1. Divide class into at least 2 groups in 2 separate areas for role playing 2. Observe students and fill out evaluation rating sheet (EV 2.9) based on this day or the previous two days performance	Role play Observe
10		3. Lead final discussion providing positive feedback	Participate in discussion

LESSON PLAN

2.D.5 Career Entry Skills - Thank you letter for Interview
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 2 (NO.) LESSON: 16 (NO.) UNIT PERFORMANCE OBJECTIVE: 2.11 (CODE NO.) COMPETENCY VERIFICATION EV 2.10 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to compose a business letter to thank a prospective employer for granting an interview.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	Kimbrell and Vineyard, Succeeding in the World of Work, Page 43	1. Explain the reason for writing a business letter to thank the employer for an interview.	Listen
5		2. Present a standard format for the letter.	
10		3. Discuss the content of the letter in terms of introductory and concluding paragraphs	
30		4. Assign students to write letters to people who interviewed them the previous day.	
		5. Provide assistance as needed	Compose letters

LESSON PLAN

2.D.5 Career Entry Skill - Letters of application
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 2 (NO.) LESSON: 17 (NO.) UNIT PERFORMANCE OBJECTIVE: 2.11 (CODE NO.) COMPETENCY VERIFICATION EV 2.10 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to write letters of application to prospective employers, free of grammatical mistakes and mispelled words.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	Kimbrell and Vineyard, Succeeding in the World of Work, pages 33-36.	1. Discuss when a letter of application is appropriate (page 33)	Listen
5		2. Present typical letter format (page 35)	View Listen
15		3. Present "suggestions" for letters of application (page 34)	Take notes
20	Assignment sheet	4. Assign letter writing task using a local firm as prospective employer	Compose rough draft of letter of application
		5. Supervise and provide assistance of rough draft	
5		6. Assign finished letters for homework	Complete final draft of letters

LESSON PLAN

2.D.5 Letters of Application - Review final draft
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 2 (NO.) LESSON: 18 (NO.) UNIT PERFORMANCE OBJECTIVE: 2.11 (CODE NO.) COMPETENCY VERIFICATION EV 2.10 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to write a letter of application using acceptable format and correct spelling and grammar.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
15	Kimbrell and Vineyard, Succeeding in the World of Work, Pages 33-36	1. Divide class into 4 groups. They should critique the letters of group members, suggest more effective wording and note errors.	Read and critique letters
20		2. Assign students to write a correct final draft, very neat!	Compose final drafts
15		3. Again, critique letters within groups.	Proof read
		4. Assign students to get letters typed as homework and re-submit typed letters in 3 days (typed letters become EV 2.10)	Obtain typing services

LESSON PLAN 2.D.6 Job Seeking Skills, Sources of assistance

(TOPICAL OUTLINE CODE NO. AND TITLE) PAGE 1 OF 2

UNIT: 2 (NO.) LESSON: 19 (NO.) UNIT PERFORMANCE OBJECTIVE: 2.12 (CODE NO.) COMPETENCY VERIFICATION EV 2.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify at least three sources of assistance/information when seeking a job.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
15	Kimbrell and Vineyard, Succeeding in the World of Work, Pages 14-21	1. Describe the purpose and function of the Georgia Employment Service. A. Employer listing B. Applicant registration/ interview C. Job referral	
10		2. Describe the operation of a private employment agency A. Employer listing B. Applicant registration C. Job referral D. Payment of fees	
5		3. Describe whatever job placement services are available through the local school system	
10	A number of newspapers	4. Draw attention to the help wanted sections of the local newspaper	
5		5. Identify parents, relatives and friends as possible sources of information about available jobs.	

LESSON PLAN (CONTINUED): 2 UNIT NO. 19 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	 STUDENTS
5		6. Distribute and explain assignment sheet with reading Pages 14-21 in reference.	Assignment will require students to identify the following: 1. Address and telephone number of the nearest State Employment Service Office. 2. One job listing from a local newspaper. 3. Name and title of any school officials performing job placement services locally. 4. (Optional) Name, address, and telephone number of a private agency.

LESSON PLAN

2.A-D Career Planning Review and Verification of Competencies
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 2 (NO.) LESSON: 20 (NO.) UNIT PERFORMANCE OBJECTIVE: 2.1-4,12 (CODE NO.) COMPETENCY VERIFICATION EV 2.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Review of the career planning unit, testing to varify specified competencies, collection and recording of all evaluation documents.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10	Blank copies of all assignment sheets associated with Unit 2	1. Review major topics and contents of the unit on career planning in preparation for testing.	Listen Answer verbal questions
5		2. Collection of all assignments not previously turned in.	Submit assignments
30	Evaluation test 2.1	3. Administer test (EV 2.1)	Respond to test items
5		4. Answer questions about test	Ask questions to clarify understanding

(EV 2.1)

NAME: ______________________ DATE: __________ SCORE: _____

INSTRUCTIONS:

In the space provided answer the following questions using complete sentences.

UPO 2.1

Three major sources of information regarding the description of tasks, working conditions, and employment outlook of occupations have been discussed. Identify one of these sources and tell where this information can be found in our school system.

Source: ____

Located: ____

UPO 2.2

List three valid reasons for working in american society.

1. ____

2. ____

3. ____

UPO 2.3

American workers have certain rights and responsibilities. List three of these rights.

1. ____

2. ____

3. ____

UPO 2.4

American employers have certain rights. These rights are also considered to be responsibilities of the worker. List three expectations that employers have of their workers.

1. ____

2. ____

3. ____

UPO 2.14

When you decide to seek a job, identify three sources of information that might help you find out about job openings.

1. ____________________

2. ____________________

3. ____________________

(EV 2.2)

NAME: ______________________________ DATE: ____________________

UPO 2.5

EVALUATION OF TERM PAPER/WRITTEN REPORT

	DONE VERY WELL	SATIS-FACTORY	MORE WORK NEEDED	NOT APPLI-cable
A. CONTENT				
1. Covered chosen subject thoroughly				
2. Major points well organized				
3. Purpose of paper made clear				
4. Conclusion or summary well thought out				
B. FORM/GRAMMAR				
1. Outline done according to accepted form				
2. Acceptable punctuation and spelling				
3. Sentences and paragraphing clear grammatical construction				
4. Quotation and citations done properly				
5. Footnotes done according to accepted form				
6. Bibliography done according to accepted form				
C. RESEARCH TECHNIQUE				
1. Good variety of source material				
2. Authorities given to substantiate opinions				
3. Paper shows writer has done ample reading on the subject				

(EV 2.3)

UPO 2.6

NAME: ______________________________ DATE: _________________

INSTRUCTIONS: Multiple Choice

Using the space provided, select the correct letter that best completes the statement.

_____ 1. When an individual is applying for a job many criteria must be considered. Which of the following is not one of the criteria to be considered when applying for a job?

A. Aptitude
B. Ability
C. Cultural values
D. Race

_____ 2. One indicator of job success would be:

A. Dismissal
B. Promotions
C. Insecurity
D. All of the above

_____ 3. If you have an aptitude in wood working you have

A. Manual dexterity
B. Natural ability
C. Capacity for learning
D. All of the above
E. None of the above

_____ 4. A person having good verbal ability has the ability to

A. Move ones hands easily and skillfully
B. See how things do or don't fit together
C. Say the right thing at the right time
D. Understand the meaning of words

_____ 5. An individuals cultural background affects

A. Career choice
B. Job success
C. Self concept
D. Morals
E. All of the above

UPO 2.6 (Continued)

_____ 6. Main cause of young workers loosing their jobs

A. Strikes
B. Attitude
C. Organized labor
D. Inflation

_____ 7. Punctuality means

A. Having a good sense of humor
B. Common sense
C. Friendliness
D. Getting to and starting to work on time

_____ 8. Having an interest in a career is not all that is necessary to be successful in it. You must also have

A. Proper aptitude and ability
B. Common sense and the desire to succeed
C. Dependability
D. None of the above
E. All of the above.

_____ 9. Your self concept is

A. How you see yourself
B. How you feel about yourself
C. Always changing
D. A factor in your career choice
E. All of the above

_____ 10. All of the following have been restricted to certain types of career choices except

A. Women
B. White males
C. Handicapped
D. Blacks
E. Teenagers

(EV 2.4)

NAME: ______________________ DATE: ______________

UPO 2.7

EVALUATION OF TERM PAPER/WRITTEN REPORT

	DONE VERY WELL	SATIS-FACTORY	MORE WORK NEEDED	NOT APPLI-cable
A. CONTENT				
1. Covered chosen subject thoroughly				
2. Major points well organized				
3. Purpose of paper made clear				
4. Conclusion or summary well thought out				
B. FORM/GRAMMAR				
1. Outline done according to accepted form				
2. Acceptable punctuation and spelling				
3. Sentences and paragraphing clear grammatical construction				
4. Quotation and citations done properly				
5. Footnotes done according to accepted form				
6. Bibliography done according to accepted form				
C. RESEARCH TECHNIQUE				
1. Good variety of source material				
2. Authorities given to substantiate opinions				
3. Paper shows writer has done ample reading on the subject				

(EV 2.5)

NAME: ______________________________ DATE: __________________

UPO 2.8

EVALUATION OF TERM PAPER/WRITTEN REPORT

	DONE VERY WELL	SATIS-FACTORY	MORE WORK NEEDED	NOT APPLI-cable
A. CONTENT				
1. Covered chosen subject thoroughly				
2. Major points well organized				
3. Purpose of paper made clear				
4. Conclusion or summary well thought out				
B. FORM/GRAMMAR				
1. Outline done according to accepted form				
2. Acceptable punctuation and spelling				
3. Sentences and paragraphing clear grammatical construction				
4. Quotation and citations done properly				
5. Footnotes done according to accepted form				
6. Bibliography done according to accepted form				
C. RESEARCH TECHNIQUE				
1. Good variety of source material				
2. Authorities given to substantiate opinions				
3. Paper shows writer has done ample reading on the subject				

application for employment

We are an equal opportunity employer, dedicated to a policy of non-discrimination in employment on any basis including race, creed, color, age, sex, religion or national origin.

PERSONAL INFORMATION

Date
Social Security Number

Name
Last First Middle

Present Address
Street City State Zip

Permanent Address
Street City State Zip

Phone No. Height Weight

State Name and Department of Any Relatives, Other Than Spouse, Already Employed By This Company

Referred By

EMPLOYMENT DESIRED

Position
Date You Can Start
Salary Desired

Are You Employed Now?
If So May We Inquire of Your Present Employer

Ever Applied to this Company Before?
Where
When

Last
First
Middle

EDUCATION

	Name and Location of School	Circle Last Year Completed	Did You Graduate?	Subjects Studied and Degree(s) Received
Grammar School			☐ Yes ☐ No	
High School		1 2 3 4	☐ Yes ☐ No	
College		1 2 3 4	☐ Yes ☐ No	
Trade, Business or Correspondence School		1 2 3 4	☐ Yes ☐ No	

Subjects of Special Study or Research Work

What Foreign Languages Do You Speak Fluently?

Read
Write

Activities Other Than Religious (Civic, Athletic, etc.)

EXCLUDE ORGANIZATIONS, THE NAME OR CHARACTER OF WHICH INDICATES THE RACE, CREED, COLOR OR NATIONAL ORIGIN OF ITS MEMBERS.

Form M660-26NR Printed in U.
©1977 Wilson Jones Company

(Continued on Other Side)

FORMER EMPLOYERS List Below Last Four Employers, Starting With Last One First

Date Month and Year	Name and Address of Employer	Salary	Position	Reason for Leaving
From To				
From To				
From To				
From To				

REFERENCES: Give Below the Names of Three Persons Not Related To You, Whom You Have Known At Least One Year.

Name	Address	Business	Years Acquainted
1			
2			
3			

PHYSICAL RECORD: Do you have any physical condition which may limit your ability to perform the job applied for?

In Case of Emergency Notify

Name Address Phone No.

I authorize investigation of all statements contained in this application. I understand that misrepresentation or omission of facts called for is cause for dismissal. Further, I understand and agree that my employment is for no definite period and may, regardless of the date of payment of my wages and salary, be terminated at any time without any previous notice.

Date Signature

DO NOT WRITE BELOW THIS LINE

Interviewed By Date

REMARKS:

Neatness		Character	
Personality		Ability	

Hired For Dept. Position Will Report Salary Wages

Approved: 1. Employment Manager 2. Dept. Head 3. General Manager

(EV 2.6)

UPO 2.9

Job Application Evaluation

NAME: ______________________ DATE: ______________

ITEMS EVALUATED	POINTS	EVALUATION
APPLICATION NEATNESS (50)		- - - - - - - - - - -
Legibility	20	
Ink	5	
Cross-outs	5	
Spelling	15	
Chronological order	5	
APPLICATION COMPLETENESS (50)		- - - - - - - - - - -
Omissions	10	
References	10	
Reasons for leaving	10	
Education curriculum	10	
Physical record	10	
TOTAL	100	

Remarks: ____

____

____

(EV 2.7)

NAME: ______________________ DATE: ____________

UPO ______

RESUME EVALUATION

ITEM EVALUATED	POINTS	EVALUATION
Application Neatness (60)		
Legibility	20	
Ink	10	
Cross-outs	5	
Spelling	15	
Chronological order	10	
Application Completeness (40)		
Omissions	10	
References	10	
Education Curriculum identified	10	
Physical record	10	
TOTAL	100	

(EV 2.8)

NAME: ______________________ DATE: ____________

UPO

INSTRUCTIONS:

Using a local telephone directory, look up the name and phone number of a local restaurant as if you were applying for a job.

A. List the address and phone number of the restaurant.

____

____

B. What part of the phone book was used to find this information?

____

C. How many other restaurants are listed in the phone directory?

____

D. Why did you select this restaurant as a prospective employer?

____

____

(EV 2.9)

UPO 2.12

Job Interview Evaluation

NAME: ______________________________ DATE: ________________

ITEMS EVALUATED	EXCELLENT	VERY GOOD	GOOD	FAIR	UNSATISFACTORY	EVALUATION
APPEARANCE	—	—	—	—	—	—
Grooming, Posture	20	16	12	8	4	
MATURITY						
Frankness, Consistency, Tact, Answers to questions asked by interviewer, Temperament	20	16	12	8	4	
PRESENTATION						
Forcefulness, Poise, Sincerity, Persuasiveness, Self-Confidence, Grammer, Vocabulary, Enunciation	20	16	12	8	4	
PREPARATION						
Knowledge of position applied for, School record, Vocational Education, Work Experience, References, Personal History	20	16	12	8	4	
PERSONAL SALESMANSHIP	20	16	12	8	4	
TOTAL POINTS	100	80	60	40	20	

(EV 2.10)

UPO

NAME: ______________________________ DATE: ____________________

LETTER OF INQUIRY

ITEMS EVALUATED	POINTS	EVALUATION
1. Contains sources of information	10	
2. Understanding of nature of position	10	
3. Willingness of individual to perform the work	10	
4. Ability of the individual to perform the work	15	
5. Information for employer to contact individual	10	
6. Legibility	15	
7. Spelling	15	
8. Grammar	15	
Total	100	

INSTRUCTIONAL PLAN

UNIT THREE

3	Communication	9 weeks total
	A. Visual communication - drafting	15 days
	1. Sketching and drafting concepts	
	a. Drafting materials and instruments	
	b. Alphabet of lines	
	c. Lettering	
	d. Shape description	
	e. Size description - dimensioning	
	f. Pictorial drawings	
	g. Working drawings	
	h. Computer assisted drafting	
	2. Drafting related careers	
	a. Engineer	
	b. Architect	
	c. Drafters	
	d. Tracer	
	e. Drafting assistant	
	B. Graphic arts	15 days
	1. Descriptions of basic graphic processes	
	a. Letterpress	
	b. Intaglio	
	c. Lithographic	
	d. Stencil or screen	
	e. Photographic	
	f. Electrostatic	
	2. History of the basic graphic processes	
	3. Relative importance of the basic processes to the graphic arts industries and to society	
	4. Supporting and related industries	
	a. Pulp and paper production	
	b. Ink, paint production	
	c. Packaging industries	
	d. Advertizing	
	e. Mass communication	
	f. Equipment production	
	g. Photographic chemicals and film production	
	h. Scientific research	

3 | Communication (Cont.)

5. Organization of a typical graphic arts industry
    a. Business office
        (1) Managers
        (2) Salespersons
        (3) Estimators
        (4) Secretaries
        (5) Clerks
        (6) Accountants
        (7) Computer programmer
        (8) Computer operator
        (9) Purchasing agent
    b. Image generation
        (1) Artist
        (2) Paste up artist
        (3) Layout artist
        (4) Typist
        (5) Type-setters of various kinds
    c. Image processing
        (1) Photographic lab technician
        (2) Camera operator
        (3) Flat stripper
        (4) Plate maker or screen exposer
        (5) Assistant printer
    d. Image transfer
        (1) Offset press operator
        (2) Press room assistant
        (3) Printing room supervisor
        (4) Screen printer
    e. Finishing and binding
        (1) Fork lift operator
        (2) Machine operator
            (a) Folder
            (b) Collator
            (c) Stitcher
            (d) Paper cutter
            (e) Binding machines
    f. Receiving
        (1) Clerk
        (2) Fork lift operator
        (3) Paper cutter
    g. Shipping
        (1) Clerk
        (2) Wrappers
        (3) Fork lift operators

3 Communication (Cont.)

- 6. Printing operations (performance)
  - a. Photography
    - (1) Camera operation
    - (2) Developing negatives
    - (3) Contact printing
    - (4) Processing printed medium (printing plate, paper, or indirect screen film)
  - b. Greeting card printing operations
    - (1) Image generation
    - (2) Photo-copy
    - (3) Plate or screen making
    - (4) Printing (offset or screen)
- 7. Binding and finishing operations
  - a. Construction of a notebook
    - (1) Layout of materials
    - (2) Cutting materials
    - (3) Glueing and pressing
  - b. Making a case bound book - (optional)
    - (1) Making a jacket
    - (2) Assembly of signatures
    - (3) Hanging the jacket
- 8. Estimating the costs of printed products and services

C. Electrical Communication 15 days

- 1. Converting messages to electrical impulses - encodeing/decoding
  - a. Simple "on" and "off" circuits - the Morse Code telegraph transmitter
  - b. Digital information
  - c. Sound to electricity - the microphone, the telephone transmitter
- 2. Electrical communication lines, switching concepts
- 3. Amplifier systems
- 4. Radio transmitting
  - a. AM
  - b. FM
- 5. Radio receiving
  - a. AM
  - b. FM
- 6. Television concepts
  - a. Image scanning
  - b. Synchronization between camera and receiver
  - c. Sound transmission

3 Communication (Cont.)

- d. Picture transmission
- 7. Radar concepts
- 8. Satellite systems
- 9. Lasers and fiber optics
- 10. Role of the Federal Communications Commission
- 11. Careers in electrical communication
  - a. Technicians
    - (1) Manufacturing
    - (2) Electrical laboratory
    - (3) Trouble-shooting-repair
    - (4) Installation
    - (5) Maintenance
    - (6) Monitoring operation
    - (7) Research, development
    - (8) Audio
    - (9) Digital
    - (10) Radio, television
    - (11) Camerman
    - (12) Linesman
  - b. Engineers
    - (1) Manufacturing, industrial
    - (2) Broadcast
    - (3) Electronic
    - (4) Computer, tele-communications
    - (5) Research, development
  - c. Verbal-visual positions
    - (1) Announcer
    - (2) Actor
    - (3) Disc-jockey
    - (4) Station manager
    - (5) Sales-advertisement
    - (6) Director
    - (7) Copy editor, writer
    - (8) Visual artist, illustrator
    - (9) Telephone operators
- 12. Application of scientific principles related to electrical communication
  - a. Sending message with Morse code and simple telegraph
  - b. Receiving AM radio signal from simple detector
  - c. Construction and operation of a simple audio amplifier
  - d. Sending information by light through fibre optic materials

LESSON PLAN

3.B.12 Sending Information by Light/Fiber Optics
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 3 (NO.) LESSON: 43 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.16 (CODE NO.) COMPETENCY VERIFICATION EV 3.14 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to explain modulation of a light beam to convey information.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
5	Assignment sheet 2 audio amplifiers, fiber optic cable	1. Explain that fiber optics can carry many more "channels" of information than conventional wires.	Listen Observe
5	Waldo T. Boyd, *Fibre Optics Communications, Experiments & Projects*,	2. Demonstrate sending a message via an optical fiber	
5	Pages 77-103.	3. Assign students to connect and demonstrate fiber optic communications components	Connect and demonstrate fiber optic components Write lab report
35		4. Provide assistance as needed	

LESSON PLAN

3.B.12 Mass Communication - Advertising
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 3 (NO.) LESSON: 44 (NO.) UNIT PERFORMANCE OBJECTIVE: 3.21 (CODE NO.) COMPETENCY VERIFICATION EV 3.16 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify the role of advertising as one major source of revenue for electrical communication, and to prepare brief announcements for local use.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
15		1. Discuss the role of advertising on commercial radio or television A. A service to clients in return for funds B. "Free" entertainment for the masses in return for purchased of goods and services C. Responsibility for honesty and fraud D. Charitable fund raising	Listen Participate in discussion
20		2. Assign students to prepare a mock advertisement for announcement by a local radio station. Suggestions: A. A yard sale B. Sale of private auto C. Announcement of a school or community event D. Solicitation for charitable funds	Write script in logical order including all necessary facts
15		3. Have selected students read scripts to the class	

LESSON PLAN

Unit Review and Competency Verification
(TOPICAL OUTLINE CODE NO. AND TITLE)
3.18; 3.19; 3.21; 3.23; 3.25

PAGE 1 OF 1

UNIT: 3 (NO.) LESSON: 45 (NO.) UNIT PERFORMANCE OBJECTIVE: ______ (CODE NO.) COMPETENCY VERIFICATION EV 3.16;3.23 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to verify their competencies in electrical communication by responding correctly to test items.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	All assignment sheets for the unit.	1. Review major topics and assignments of the unit	Listen Answer questions
5		2. Collect all assignments not previously submitted	
5		3. Preview competencies which will be verified	
30	Evaluation sheets	4. Administer evaluation sheets 3.16 and 3.23	Respond to test items
5		5. Collect sheets and answer questions	Ask questions

(EV 3.1)

NAME: ______________________ DATE: __________ SCORE: ________

UPO 3.2

1. INSTRUCTIONS:

Study the Feeder Plate, BP-5.

A. Locate each line from A to Z and identify each according to the alphabet of lines:

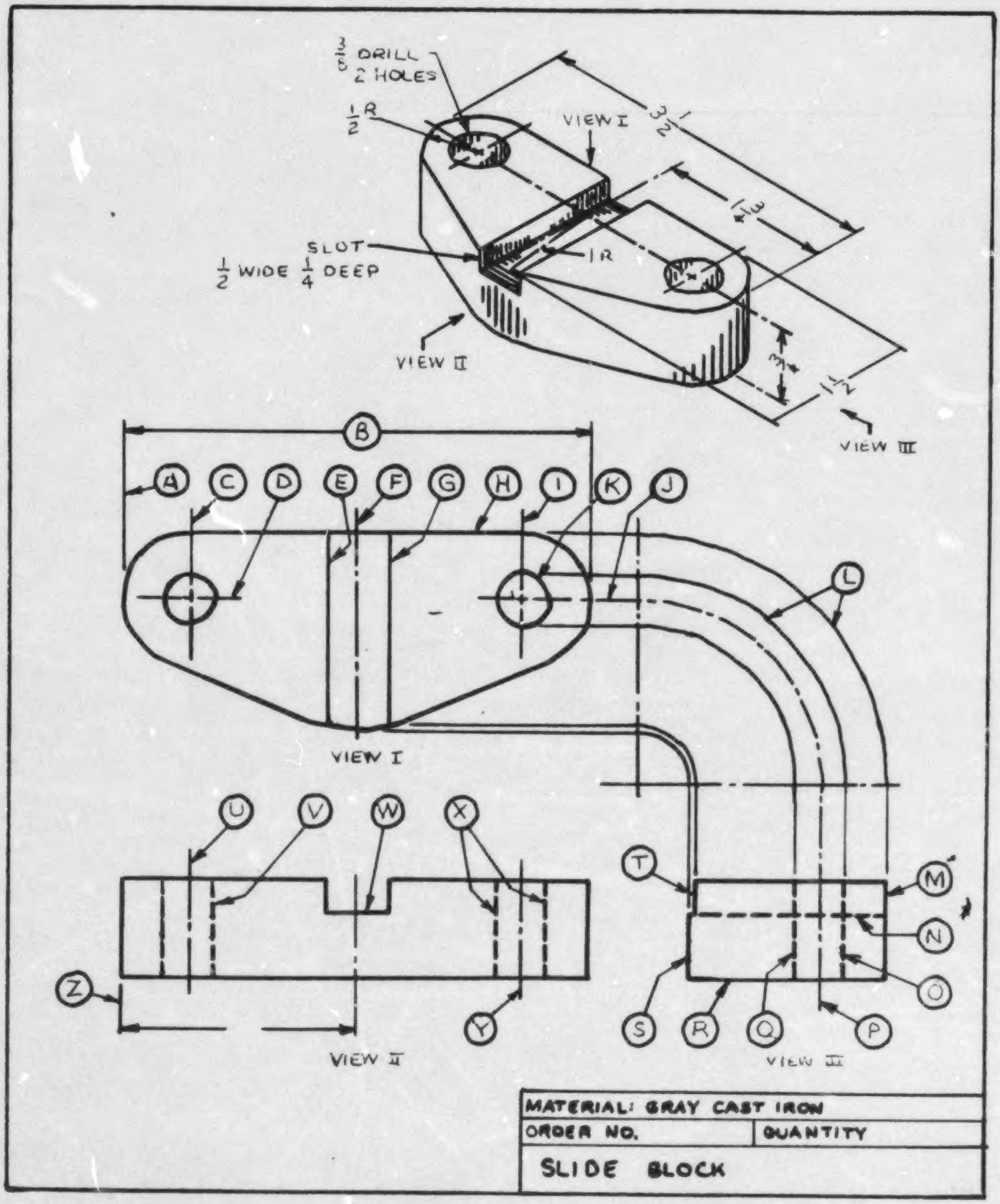
B. Tell how each line from A to L is identified. (Note: Line A is filled in as a guide)

LINE OF DRAWING	(A) NAME OF LINE	(B) HOW THE LINE IS IDENTIFIED
A	Extension line	Fine, unbroken line
B		
C		
D		
E		
F		
G		
H		
I		
J		
K		
L		

M		LINE	(A) NAME OF LINE
N		U	
O		V	
P		W	
Q		X	
R		Y	
S		Z	
T			

(EV 3.1)

NAME: ______________________ DATE: ______________



MATERIAL: GRAY CAST IRON

ORDER NO. QUANTITY

SLIDE BLOCK

(EV 3.2)

NAME: ______________________________ DATE: ____________ SCORE: ______

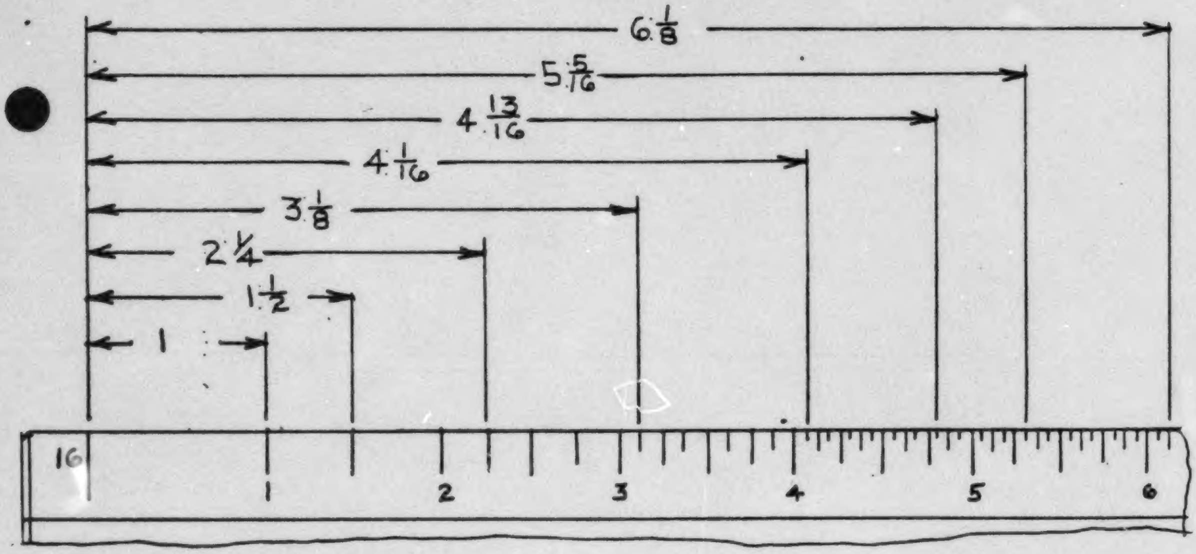
UPO 3.3

INSTRUCTIONS:

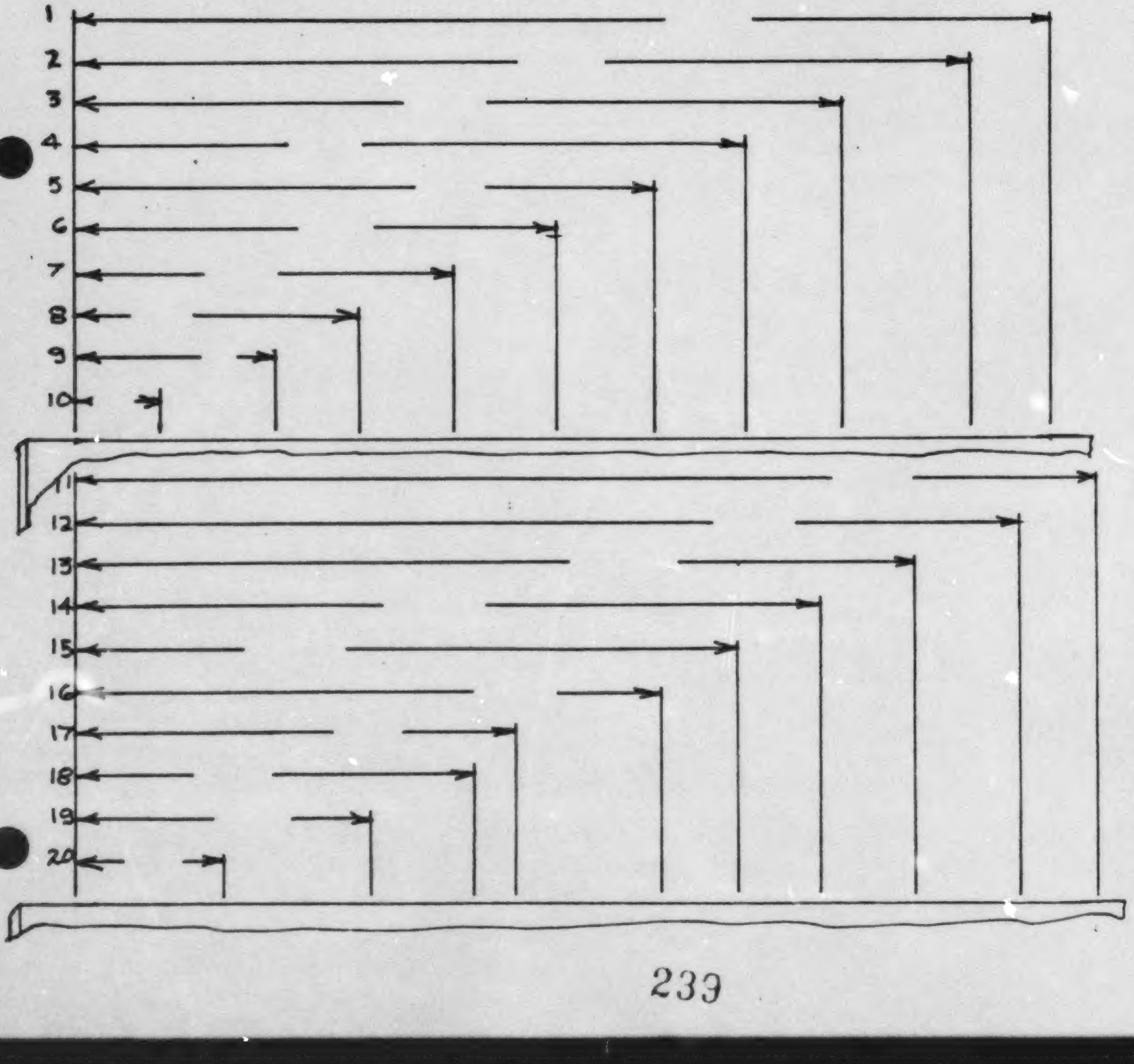
Using a seperate sheet of paper, record the lengths of lines 1-20 and A-P as shown on the following pages. Answers must be given to the nearest 1/16 of an inch and be shown in lowest terms.

EV 3.2

SHEET 1
MEASUREMENT



COMPLETE 1 THRU 20 AS SHOWN

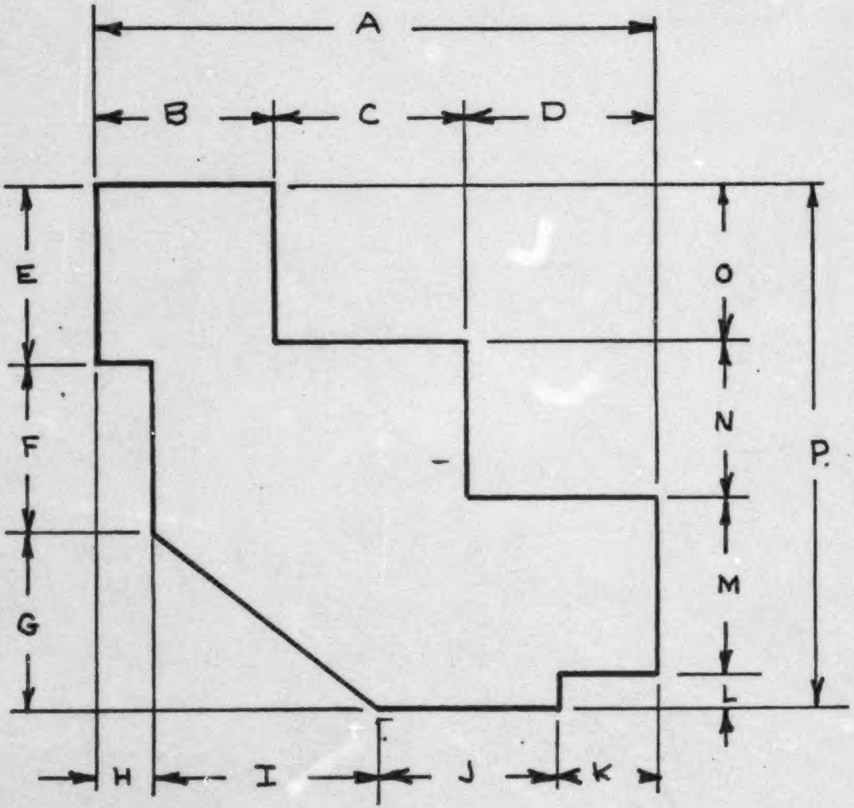


EV 3.2

SHEET 2

MEASUREMENT

FILL IN DIMENSIONS



(EV 3.3)

NAME: ______________________ DATE: _____________ SCORE: ________

UPO 3.4

INSTRUCTIONS:

Using the attached sheets hand letter the information as shown in the guide lines provided.

(EV 3.3)

NAME: ______________________ DATE: ______________

THE DEVELOPMENT OF A HIGH DEGREE OF PRECISION IN FORMING AND SPACING OF LETTERS. IN ANY LETTERS UNIFORMITY IS ESSENTIAL.

ALMOST ANYONE CAN LEARN TO LETTER IF PERSISTENT AND INTELLIGENT IN HIS/HER EFFORTS. WHILE IT IS TRUE THAT "PRACTICE MAKES PERFECT" THERE MUST BE CONTINUOUS EFFORT TO IMPROVE. NO MATTER HOW WELL THE LINE WORK OF A DRAWING HAS BEEN DONE, THE DRAWING MAY BE RENDERED USELESS BY POOR LETTERS.

(EV 3.3)

NAME: ______________________ DATE: ______________

1 2

3 4

5 6

7 8

9 0

$\frac{1}{2}$ $\frac{3}{4}$ .50 .75

$\frac{5}{8}$ $\frac{9}{16}$ .62 .56

90 3.75 8926 43.50 207

$\frac{9}{16}$ $\frac{13}{32}$ $\frac{27}{64}$ $\frac{3}{8}$ $\frac{7}{32}$ $\frac{5}{16}$ $\frac{1}{4}$ $\frac{3}{16}$ $\frac{7}{8}$ $\frac{15}{16}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{1}{2}$

3954 .7128 60.32 5884 3287 19.34 6502 48.9

$5\frac{3}{8}$ $9\frac{9}{16}$ $8\frac{3}{4}$ $2\frac{5}{32}$ $20\frac{3}{8}$ $1\frac{7}{8}$ $39\frac{5}{64}$ $\begin{matrix}2.500\\2.498\end{matrix}$ $\begin{matrix}1.724\\1.720\end{matrix}$ $\begin{matrix}5.5898\\5.5894\end{matrix}$ $\begin{matrix}7.50\\7.46\end{matrix}$

(EV 3.4)

NAME: ____________________ DATE: ________________

UPO 3.5

Orthographic Projection Evaluation

ITEMS EVALUATED	POINTS	EVALUATION
Neatness	20	
Accuracy	20	
Proper use of projection principles	20	
Proper use of alphabet of lines	20	
Lettering	20	
TOTAL	100	

(EV 3.5

NAME: ________________________________ DATE: ________________

UPO 3.6

Oblique Projection Evaluation

ITEMS EVALUATED	POINTS	EVALUATION
Neatness	20	
Accuracy	20	
Proper use of projection principles	20	
Proper use of alphabet of lines	20	
Lettering	20	
TOTAL	100	

(EV 3.6)

NAME: ______________________________ DATE: ________________

UPO 3.7

Identification of three careers which utilize drafting skills - Homework assignment.

ITEMS EVALUATED	POINTS	EVALUATION
Accuracy	25	
Completeness	25	
Proper use of grammer	25	
Logical thought patterns	25	
Total	100	

(EV 3.7)

NAME: ______________________________ DATE: ________________________

UPO 3.8

INSTRUCTIONS:

Select the correct answer and place the letter for it in the space provided.

_____1. Identify a hidden line

A. ____________________

B. _________ ___ ______

C. - - - - - - - - - - - -

D. _______ ___ ___ _____

_____2. Construction lines should always be __

A. Thick and black

B. Drawn in ink

C. So light they can be barely seen

D. Drawn with a soft pencil

_____3. The T-square is used for ___

A. Keeping the paper straight

B. Guiding the pencil while drawing horizontal lines

C. Guiding the pencil while drawing vertical lines

D. Measuring angles

_____4. An engineer's scale is used when drawing ___

A. Machine parts

B. House plans

C. Full scale furniture plans

D. Highways

_____5. In order for you to become an architect it will be necessary to __

A. Have a college degree

B. Pass a licensing exam

C. Have a good working knowledge of drafting

D. All of the above

_____6. When making a three view drawing the views should normally include the top, ___, and ___

A. Right side and front

B. Left side and front

C. Bottom and left side

D. Right side and back

_____7. In a three view drawing the view shown as the front is normally the view that ___

A. Has a flat bottom

B. Shows the least objectional detail

C. Shows the most detail

D. None of the above

_____8. Drafting principles are used in which of the following careers?

A. Football coach

B. Engineer

C. Dress maker

D. None of the above

E. All of the above

_____9. A dimension line is used to show ___

A. The outside shape of an object

B. The size of an object

C. That an object has been cut to show the inside of the object

D. The bottom of the object

_____10. Drafting pencils are graded from hard to soft by a number and letter code. A pencil used for fine construction lines would be a __

A. 5 H

B. H

C. HB

D. No. 2

UPO 3.9

Graphic Arts Processes

INSTRUCTIONS:

Describe the major principle or characteristic of each of the following processes.

1. Letter press ____________________

2. Intaglio ____________________

3. Lithographic ____________________

4. Stencil or screen ____________________

5. Photographic ____________________

6. Electrostatic ____________________

UPO 3.10

Graphic Arts Related Industries

INSTRUCTIONS:

Identify at least five (5) industries related to or supportive of graphic arts functions.

1. ____________________
2. ____________________
3. ____________________
4. ____________________
5. ____________________

(EV 3.9)

UPO 3.11

Organization of Printing Enterprise (Personnel Chart)

TEAM: ____ ______________________________

____

____

	Yes	No
Was Work Completed?	___	___
Organizational chart	___	___
Departmental functions	___	___
Job Titles	___	___
Primary tasks of workers	___	___

QUALITY OF WORK	EXCELLENT	GOOD	ACCEPTABLE	UNACCEPTABLE
Art work, craftsmanship				
Information presented				

Remarks: ____

____

____

(EV 3.10)

UPO 3.12

Printing Project Evaluation

TEAM: _____ ______________________________

____

____

	POINTS	EVALUATION AND REMARKS
Procedure report	25	
Display of negatives and/or photo-masks	25	
Initial project plans (layout)	25	
Final project result	25	
TOTAL	100	

(EV 3.11)

NAME: ______________________________ DATE: ______________

UPO 3.13

Bindery Evaluation

	POINTS	EVALUATION AND REMARKS
Use of proper materials	30	
Use of proper procedures	30	
Workmanship	40	
TOTAL	100	

(EV 3.12)

NAME: ________________________________ DATE: ______________

UPO 3.14

PART I

INSTRUCTIONS:

Answer the following questions using a separate sheet of paper.

1. Identify the major factors which affect the cost of printed products.

2. Produce a bill of materials listing the individual materials used to produce your project, the cost of each material, the quantity of the materials used, and calculate the total cost of the project.

(EV 3.13)

NAME: ______________________ NAME: ______________

UPO 3.15

INSTRUCTIONS

Answer the following questions using a separate sheet of paper. Multiple-choice statments: Select the correct answer, and place the letter for it on the answer sheet.

1. Wood furniture is measured in length of picas in multiples of

   A. 2 picas B. 5 picas C. 8 picas D. 10 picas

2. Reglets are made in thicknesses of

   A. 2 & 4 points C. 6 & 12 points
   B. 4 & 8 points D. 8 & 10 points

3. When a relief form is locked up, the quoins should be positioned to the ___ of the form.

   A. Top & Bottom C. Top & Right
   B. Left & Right D. Left & Bottom

4. In processing film in a tray the second tray should contain

   A. Developer C. Fixer
   B. Stop bath D. Water wash

5. To harden the emulsion, and remove unexposed emulsion the ___ bath is used

   A. Developer C. Stop bath
   B. Wash D. Fixer

6. The letterpress operation which produces a raised design on the paper is ___

   A. Die cutting C. Embossing
   B. Laminating D. Perforating

7. To make sheets of paper easy to tear along a given line, they are often ___

   A. Perforated C. Slit
   B. Die cut D. Scored

8. Inner sheets are held in the loose leaf binder constructed in class by

   A. Rings
   B. String
   C. Binding posts
   D. Glue

9. Which material is not used in book binding

   A. Paper
   B. Glue
   C. Binders board
   D. Book clothe
   E. Rubber

10. As the squeegee is passed over the stencil, it should be held at approximately a ___ angle.

    A. 10° B. 20° C. 30° D 50°

11. Lacquer film stencils are removed from the screen fabric with ___

    A. Benzine
    B. Kerosene
    C. Water
    D. Lacquer thinner

12. The jogger guide should be aligned with the register board

    A. Tape guide
    B. Paper guide
    C. Graduate scale

13. A working solution of ortho developer is prepared by combining

    A. 1 part A with 2 parts B with 3 parts water
    B. 2 parts A with 1 part B with 4 parts water
    C. 1 part A with 1 part B with 6 parts water
    D. 1 part A with 3 parts B with no water

14. In ortho photography film development, it is necessary to have the chemical solutions in four trays in the following left to right order.

    A. Developer, fixer, stop bath, and running water
    B. Developer, stop bath, fixer, and running water
    C. Stop bath, developer, fixer, and running water
    D. Fixer, developer, stop bath, and running water

15. The cut-outs of a paper mask should be larger than the design area on all sides by at least

    A. 1" B. 2" C. 3" D. 4"

16. The graphic arts process used to print the greatest volume of todays products is

    A. Letterpress   C. Screen
    B. Offset   D. Electrostatic

17. The drawsheet should be wider than the sheet to be printed by

    A. 2" or 3"   C. 6" or 7"
    B. 4" or 5"   D. 8" or 9"

18. An aqua film stencil can be removed from the screen fabric with

    A. Benzine   C. Water
    B. Kerosene   D. Lacquer thinner

19. Ortho negatives should be allowed to wash in running water for about

    A. 5 minutes   C. 15 minutes
    B. 10 minutes   D. 20 minutes

20. An ortho test strip should be left in the fixer for

    A. 2 to 4 minutes   C. 8 to 10 minutes
    B. 6 to 8 minutes   D. 10 to 12 minutes

21. A graphic arts salesperson may sell

    A. space   D. Pictures
    B. Ink   E. All of these
    C. Books

22. A graphic arts salesperson communicates to such groups as

    A. Farmers   D. All of these
    B. Doctors   E. None of these
    C. Engineers

23. A press operator has the responsibility of

    A. Selling space in magazines
    B. Keeping an inventory of all materials in the printing shop
    C. Setting up and operating a printing press
    D. Taking photographs to be used in printing materials

24. Things that need to be considered when estimating the cost of a graphic arts product are

    A. Paper
    B. Ink
    C. Overhead
    D. Time
    E. All of these

25. Which industries listed below do not use skills related to the graphic arts?

    A. woodworking
    B. Electronics
    C. Metal working
    D. Leather craft
    E. None of the above

(EV 3.14)

UPO 3.16

LABORATORY ACTIVITY CHECKLIST

(ELECTRICAL)

TEAM: _____ ______________________________

____

____

ACTIVITY	SUCCESSFULLY COMPLETED
1. Telegraph sender/receiver	
2. Crystal radio receiver	
3. Audio amplifier	
4. Fibre optic communication line	

(EV 3.15)

NAME: ______________________ DATE: ______________

UPO 3.17

EVALUATION OF TERM PAPER/WRITTEN REPORT

	DONE VERY WELL	SATIS-FACTORY	MORE WORK NEEDED	NOT APPLI-cable
A. CONTENT				
1. Covered chosen subject thoroughly				
2. Major points well organized				
3. Purpose of paper made clear				
4. Conclusion or summary well thought out				
B. FORM/GRAMMAR				
1. Outline done according to accepted form				
2. Acceptable punctuation and spelling				
3. Sentences and paragraphing clear grammatical construction				
4. Quotation and citations done properly				
5. Footnotes done according to accepted form				
6. Bibliography done according to accepted form				
C. RESEARCH TECHNIQUE				
1. Good variety of source material				
2. Authorities given to substantiate opinions				
3. Paper shows writer has done ample reading on the subject				

(EV 3.16)

NAME: ______________________________ DATE: ____________

UPO 3.18

INSTRUCTIONS:

Using a separate sheet of paper, answer the following questions.

Part 1. Describe the function of communications amplifiers using the following concepts.

a. Relative magnatude of input and output signals.

b. Linearity of input and output signals.

c. Actual power source which operates amplifier.

UPO 3.19

Part II. Define the following terms.

1. Carrier wave
2. Amplitude modulation
3. Frequency modulation
4. Antenna
5. Tower
6. Tuning circuit
7. Detector
8. Audio amplifier
9. Speaker or headphones

(EV 3.16)
(CONT.)

UPO 3.23

INSTRUCTION:

Describe the role of the Feceral Communications Commission in the following:

1. Station license approval

2. Frequency allocations

3. Interference eliminations

4. Enforcement

(EV 3.16)

NAME: ______________________ DATE: ________ SCORE: _____

UPO 3.21

INSTRUCTIONS

Answer the following statements using a true or false answer.

_____ 1. Expenses of televising a football game are paid for by the companies that advertise during the show.

_____ 2. The television networks are in business solely for the purpose of informing and entertaining the american public.

_____ 3. Advertisers on television have a substantial amount of control over what kinds of television programs are shown and associated with their products.

_____ 4. Every television and radio station is required by the FCC to carry free public service announcements.

_____ 5. Advertising is a major source of profit for newspapers and magazines.

_____ 6. An advertisement aimed primarily at business executives would most likely appear in the sport section of a newspaper.

_____ 7. All advertisement that appears during the super bowl game will cost the same as an advertisement during a pre-season game.

_____ 8. Public broadcasting receives operating capitol in the same manner as do commercial broadcasting networks.

_____ 9. A manufacturer who does not advertise in any mass communication medium probably has a product of limited value to the common citizen.

_____ 10. Cable television service is paid for by the subscribers.

(EV3.17)

NAME: ______________________ DATE: ______________

UPO 3.20

EVALUATION OF TERM PAPER/WRITTEN REPORT

	DONE VERY WELL	SATIS-FACTORY	MORE WORK NEEDED	NOT APPLI-cable
A. CONTENT				
1. Covered chosen subject thoroughly				
2. Major points well organized				
3. Purpose of paper made clear				
4. Conclusion or summary well thought out				
B. FORM/GRAMMAR				
1. Outline done according to accepted form				
2. Acceptable punctuation and spelling				
3. Sentences and paragraphing clear grammatical construction				
4. Quotation and citations done properly				
5. Footnotes done according to accepted form				
6. Bibliography done according to accepted form				
C. RESEARCH TECHNIQUE				
1. Good variety of source material				
2. Authorities given to substantiate opinions				
3. Paper shows writer has done ample reading on the subject				

([illegible] 18)

NAME: ______________________________ DATE: ____________________

[illegible] 3.20

EVALUATION OF TERM PAPER/WRITTEN REPORT

	DONE VERY WELL	SATIS-FACTORY	MORE WORK NEEDED	NOT APPLI-cable
A. CONTENT				
1. Covered chosen subject thoroughly				
2. Major points well organized				
3. Purpose of paper made clear				
4. Conclusion or summary well thought out				
B. FORM/GRAMMAR				
1. Outline done according to accepted form				
2. Acceptable punctuation and spelling				
3. Sentences and paragraphing clear grammatical construction				
4. Quotation and citations done properly				
5. Footnotes done according to accepted form				
6. Bibliography done according to accepted form				
C. RESEARCH TECHNIQUE				
1. Good variety of source material				
2. Authorities given to substantiate opinions				
3. Paper shows writer has done ample reading on the subject				

EV 3.19

NAME: ______________________ DATE: ______________

PRO 3.20

EVALUATION OF TERM PAPER/WRITTEN REPORT

	DONE VERY WELL	SATIS-FACTORY	MORE WORK NEEDED	NOT APPLI-cable
A. CONTENT				
1. Covered chosen subject thoroughly				
2. Major points well organized				
3. Purpose of paper made clear				
4. Conclusion or summary well thought out				
B. FORM/GRAMMAR				
1. Outline done according to accepted form				
2. Acceptable punctuation and spelling				
3. Sentences and paragraphing clear grammatical construction				
4. Quotation and citations done properly				
5. Footnotes done according to accepted form				
6. Bibliography done according to accepted form				
C. RESEARCH TECHNIQUE				
1. Good variety of source material				
2. Authorities given to substantiate opinions				
3. Paper shows writer has done ample reading on the subject				

(EV3.20)

NAME: ______________________ DATE: ______________

EPD 3.20

EVALUATION OF TERM PAPER/WRITTEN REPORT

	DONE VERY WELL	SATIS-FACTORY	MORE WORK NEEDED	NOT APPLI-cable
A. CONTENT				
1. Covered chosen subject thoroughly				
2. Major points well organized				
3. Purpose of paper made clear				
4. Conclusion or summary well thought out				
B. FORM/GRAMMAR				
1. Outline done according to accepted form				
2. Acceptable punctuation and spelling				
3. Sentences and paragraphing clear grammatical construction				
4. Quotation and citations done properly				
5. Footnotes done according to accepted form				
6. Bibliography done according to accepted form				
C. RESEARCH TECHNIQUE				
1. Good variety of source material				
2. Authorities given to substantiate opinions				
3. Paper shows writer has done ample reading on the subject				

(EV 3.21)

CPO 3.22

Electronic

Organization of Electronic Enterprise (Personnel Chart)

TEAM: _____ ______________________________

____

____

	Yes	No
Was Work Completed?	___	___
Organizational chart	___	___
Departmental functions	___	___
Job Titles	___	___
Primary tasks of workers	___	___

QUALITY OF WORK	EXCELLENT	GOOD	ACCEPTABLE	UNACCEPTABLE
Art work, craftsmanship				
Information presented				

Remarks: ____

____

____

(EV 3.22)

UPO 3.24

STUDENT'S NAME: ______________________________ DATE: ____________

SOLDERING SKILL

	EXCELLENT	GOOD	ACCEPTABLE	UNACCEPTABLE
Amount of solder				
Application of heat				
Flow-coverage				
No damaged parts				

(EV 3.23)

UPO 3.25

NAME: ________________________________ DATE: _______________

INSTRUCTIONS:

In the space provided fill in the correct TRUE or FALSE answer to make the following statements correct.

_____ 1. Electronics manufacturing plants are located in nearly every state in the union.

_____ 2. Physicists, mathematicians, and electrical engineers gain entry into the electricity/electronics fields usually through apprenticeship.

_____ 3. Magnetism and electricity are not related.

_____ 4. An electronic device such as a television operates internally only on direct current principles.

_____ 5. Magnet wire always comes with an insulated coating.

_____ 6. Electricity can be changed into magnetism, but magnetism cannot be changed into electricity.

_____ 7. Telegraph equipment requires electromagnets to receive coded messages.

_____ 8. Loud speakers contain a permanent magnet.

_____ 9. Shielded cable is used for wiring doorbells.

_____ 10. It is not necessary to disconnect the electricity when you are working on a circuit.

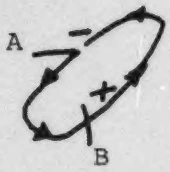
INSTRUCTIONS:

In the spaces provided fill in the correct answer that is to make the statement complete.

1. Electricity can make __________________ which can be used to create physical motion.

2. Do not test a wiring job or project until it has been ________.

3. Name the parts of the atom



A. ______________________

B. ______________________

4. The flow of free electrons is actually what produces __________.

5. The kind of electricity that can be produced by friction is

_________________________ electricity.

6. The theory which explains the flow of electricity is known as

the _________________________ theory.

7. Another name for bell wire is _______________ wire.

8. An electromagnet can be made by winding a coil of wire

around a _____________________.

9. A battery is rated by the number of ________________ it will produce.

10. In factories and other industrial buildings, _________________ is used for running wires.

INSTRUCTIONS:

In the space provided, select the correct letter which completes the statements. Some questions have one right answer, others have one wrong answer.

_____ 1. A substance which will not carry an electrical current is

A. Glass
B. Aluminum
C. Copper
D. Brass

____ 2. The heating element inside a bulb is made of (one right):

A. Aluminum
B. Carbon
C. Tungsten
D. Copper

____ 3. Which of the following is not a part of a telegraph circuit.

A. A commutator
B. A key
C. Wire
D. A battery

____ 4. Pick the false statement comparing electron tubes with transistor

A. Transistors are much smaller
B. Electron tubes are more expensive
C. Transistors last longer
D. Electron tubes consume more power
E. Transistors operate at higher voltages

____ 5. What kind of solder flux is recommended for electrical work.

A. Sal ammonia
B. Acid
C. Rosin
D. Salt

____ 6. What Federal Agency controls Broadcast transmission of radio waves

A. Federal Communication Commission
B. Environmental Protection Agency
C. Equal Opportunity Commission
D. UPS Government Printing Office.

____ 7. Which kind of conductor can carry the most communication channels at once

A. Copper wire
B. Micro-wave guide
C. Fibre optic
D. Telegraph wire

_____ 8. Which electrically related career requires the most years of training

A. Radio repairperson
B. Electricians helper
C. Technician
D. Engineer

_____ 9. Which electrically related career requires the least amount of study in mathematics and physics

A. Cable service installer
B. Laboratory technician
C. Engineer
D. Computer programmer

_____ 10. What common communication equipment requires a station license to legally operate.

A. TV set
B. CB radio
C. Hi-Fi
D. FM radio

INSTRUCTIONAL PLAN

UNIT FOUR

4	Principles of Economics/Business/Free Enterprise	4 weeks total
	A. The need for an economic system in a society	3 days
	B. Three basic economic questions	3 days

A. The need for an economic system in a society — 3 days
   1. Meeting individual needs and desires through trade-offs with others
   2. The barter system
   3. The function of money
   4. Laws

B. Three basic economic questions — 3 days
   1. What kinds of goods and services will be produced?
      a. Wants and needs - food, shelter, clothing
      b. Available resources
      c. Supply and demand
      d. Degree of specialization of the work force
      e. Degree of interdependence of individuals and institutions
      f. Cost of taking advantage of opportunities and resources
   2. How will goods and services be produced?
      a. Broad categories of technology
         (1) Agriculture - food and fiber production
         (2) Transportation
         (3) Communication
         (4) Construction
         (5) Energy production, distribution and control
         (6) Manufacturing
         (7) Medical care
         (8) Mineral extraction - mining, drilling
         (9) Education of youth
         (10) Scientific advancement
         (11) Military protection
         (12) Relationship between these "how" technologies and the U.S. Office of Education's 13 clusters of occupations
         (13) Reference to other major units of this course

- b. Forms of organization
  - (1) Sole proprietorship, self-employed or family employed enterprise
  - (2) Partnerships
  - (3) Corporations
- 3. For whom will goods and services be produced?
  - a. Individuals with particular needs or desires
    - (1) Primary needs - food, shelter, clothing
    - (2) Secondary needs
    - (3) Luxuries
  - b. Groups
  - c. Types of market structures
    - (1) Perfect competition (free market)
    - (2) Monopoly
    - (3) Oligopoly
    - (4) Monopolistic competition
  - d. Governmental regulation
- C. Resources to participate in the marketplace — 3 days
  - 1. Human resources
    - a. Labor
      - (1) Specialization, division of labor
      - (2) Benefits of training or retraining
    - b. Entrepreneural skills
  - 2. Capital resources
    - a. Capital equipment and facilities
    - b. Role of money
    - c. Functions of banks and the Federal Reserve System
    - d. Circular flow of money
    - e. Income distribution
      - (1) Wages, interest, rents, and profits
      - (2) Redistribution of income through taxes and transfer payments
    - f. Role of saving and investing
  - 3. Land resources
    - a. Area or space for business
    - b. Agriculture
    - c. Minerals
    - d. Considerations for use

4. Risks of participation
   a. Failure to meet needs through expended resources
   b. Loss of value or resources
   c. Exchanging present resources for those of less value

D. Economic relationships 3 days
   1. Supply and demand
   2. Risk - profit - loss - security
   3. Price determination of a product or service
      a. Materials
      b. Personnel
         (1) Labor
         (2) Management
         (3) Fringe benefits
      c. Capital goods
      d. Overhead
         (1) Energy
         (2) Utilities
         (3) Interest on loans
         (4) Insurance
      e. Advertising
      f. Reinvestment - future development
      g. Taxes, licenses, permits

E. Effects of Government Regulations, Laws, Activities 1 day
   1. Insured savings
   2. Antitrust acts
   3. Consumer protection
   4. Fiscal policy - government spending and taxation
   5. Monetary policies - Federal Reserve Board
   6. Measuring the performance of the economy - G.N.P.
   7. Controlling foreign trade
      a. Tariffs
      b. Balance of trade and payments
      c. Currency recognition and exchange
   8. Human resource development (education)
   9. Military activity

F. Functional Parts of a Corporation 2 days
   1. Stockholders
      a. Elect Board of Directors
      b. Provide overall direction and policies
      c. Provide capital

4 Principles of Economics/Business/Free Enterprise (Cont.)

2. Board of Directors
    a. Recommend policy to stockholders
    b. Report to stockholders
    c. Hire top-level administrative team
    d. Provide guidelines for top-level administrative team
3. Management/administration
    a. Plan and operate the enterprise
    b. Develop new ideas for goods or services
    c. Maintain records of the enterprise
    d. Make daily working policies
    e. Hire supervisors, workers
    f. Conducts transactions with other enterprises
    g. Report to the Board of Directors
    h. Make decisions within guidelines
4. Labor
    a. Perform the tasks of the enterprise
    b. Report to foreman or supervisor for assignments
    c. May form labor unions which work for
        (1) Higher pay
        (2) Shorter working hours
        (3) Fringe benefits
        (4) Better working conditions
        (5) Fellowship and social welfare
        (6) Job protection
        (7) Political goals or candidates
        (8) Education of youth or replacement workers
    d. Rights and expectations of workers and employers

NOTE: Refer to the experiences which will be completed in the Manufacturing Technology unit of this course.

G. Comparison of American Free Enterprise Economy with Other Systems — 1 day
1. Laissez Faire - free market
2. Socialism - political government control of the means of production of goods and services in major industries
3. Communism - common or societial (classless) partnership of the means of production and subsistence

    4. Fascism - cooperation of large industries with a dictator

H. Inflation

    1. Rising demand
    2. Rising costs
        a. Cheap credit
        b. Government purchasing

I. Recession

    1. Falling demand
        a. Decrease in consumer spending
        b. Decrease in firms investment spending
    2. Oversupply of hard goods
        a. Decrease in production
        b. Increased unemployment

J. Depression

    1. Over-expansion of basic industries
    2. Overspeculation in stocks, capital equipment, land, commodities
    3. Manipulation of stock market
    4. Lack of credit among common workers
    5. Unemployment
    6. Business and banking failures
    7. Preventive governmental controls - monetary and fiscal policies

2 days (H - J)

UNIT PERFORMANCE OBJECTIVES

UNIT FOUR

UNIT PERFORMANCE OBJECTIVES		EVAL INSTRUMENT CODE
UNIT 4	Free Enterprise	
4.1	Upon completion of the unit, students will explain with 100 percent accuracy on a written test the basic economic problem facing all societies.	EV 4.1
4.2	Identify with 100 percent accuracy on a written test the three questions facing every economic system and analyze how our society has organized to solve those questions.	EV 4.1
4.3	Explain with 100 percent accuracy in writing the interrelationships that exist among natural, human, and capital resources and human needs and wants.	EV 4.1
4.4	Explain how specialization permits scarce resources to be more efficiently used and assess why it is important for both domestic and international economic activity.	EV 4.1
4.5	Demonstrate with charts how prices are determined by the supply of and demand for each good, service, or factor of production.	EV 4.2
4.6	Complete and debrief a decision-making exercise using a method of problem solving designed for making economic choices.	EV 4.1
4.7	Describe with 100 percent accuracy the characteristics of the free enterprise system.	EV 4.1
4.8	Describe and analyze in a paper how the profit motive helps to determine resource allocation and distribution of income.	EV 4.1
4.9	Describe and analyze the relationship of the profit motive to the rewards for risk taking.	EV 4.1

UNIT PERFORMANCE OBJECTIVES

UNIT 4 Free Enterprise (Cont.)

4.10	List with 100 percent accuracy a variety of sources of funds for financing business enterprises.	EV 4.1
4.11	Identify and discuss in a report the various forms of business organization and the advantages and disadvantages of each.	EV 4.3
4.12	Explain in writing with 90 percent accuracy the role of competition in the private enterprise system and list its benefits to consumers.	EV 4.1 4.2
4.13	Describe the role of savings and investment in capital formation and relate to the teacher's satisfaction its significance to levels of production and economic growth.	EV 4.1
4.14	Explain in writing how the advancement of technology increases productivity, benefits the consumer; and stimulated economic growth.	EV 4.2
4.15	Distinguish on a written exam with 100 percent accuracy between the various types of market structures with regard to types of firms, level of competition, types of products, and determination of prices by competitive or noncompetitive processes.	EV 4.1 4.2
4.16	Explain orally to the teacher's satisfaction the role of prices in allocation of resources, goods, and services.	EV 4.1 4.2
4.17	Explain in writing with 100 percent accuracy the relation between price and quantity of goods demanded and supplied.	
4.18	Participate in a class discussion on how the productivity of labor, capital, land, and entrepreneurship helps to determine the incomes to each of the factors of production.	EV 4.2
4.19	Describe with 100 percent accuracy the role of money and the effects on economic activity of decreasing or increasing the quantity of money in a private enterprise economy.	EV 4.1
4.20	Discuss several effects of government regulation on consumers and producers in the American economy.	EV 4.1 4.2

UNIT PERFORMANCE OBJECTIVES

UNIT 4 Free Enterprise (Cont.)

4.21	State in writing the rationale for the federal government's assuming a role in helping to stabilize the economy.	EV 4.2
4.22	Explain in a panel discussion how economic specialization promotes foreign trade and world interdependence.	EV 4.2
4.23	Differentiate in a matching question among traditional, command, market, and mixed economic systems with regards to a. ownership of property b. distribution of income c. role of government d. economic incentives	EV 4.2
4.24	Describe with 100 percent accuracy the structure of the Federal Reserve System and list its main functions with regard to monetary policy.	EV 4.1
4.25	State with 100 percent accuracy what Gross National Product measures.	EV 4.2
4.26	Describe in class discussion the inpact of inflation on the economic decisions of businesses and households.	EV 4.2
4.27	Explain in a brief paper how the federal government's taxation and expenditures policies affect inflation and employment.	EV 4.4

IDEAS FOR DEVELOPMENT

ECONOMICS/BUSINESS/FREE ENTERPRISE

FUNCTION OF GOVERNMENT

Services
Regulations
Redistribution of income
  (taxes and transfer payment)
Stabilization

WHAT? ECONOMIC CONCEPTS

Wants and needs
Scarcity/choices
Resources
Opportunity cost
Supply and demand
Specialization, Division
  of labor, interdependence

GROWTH AND STABILIZATION POLICIES

Monetary Policies
Fiscal Policies
Inflation Policies
Employment
Saving and Investment
Measuring the Performance of
  Economy (GNP, etc.)

DECISION MAKING

Values
Goals
Goal conflict/Trade offs
Resource contraints/Limitations
Utility
Optimization
Demand
Advertising
Lifestyles
Decision-making
Consumer surplus

HOW?

Private
  Enterprise

Forms of
  Organization
Competition
Risk
Profit
Values and
  goals
Economic
  incentives
Financing
  Private
  Enterprise
Functions of
  business
  (production,
  etc.)

FOR WHOM?
PRODUCT AND RESOURCE MARKETS

Markets for goods
  and services
Price mechanism
Types of competition
  (monopoly, etc)
Factors of production
  - land, labor,
  capital,
  entrepreneurship
Circular flow of
  money
Income distribution

FOREIGN TRADE

Balance of payments
Balance of trade
Comparative advantage

ECONOMIC SYSTEMS

Traditional
Command
Market
Mixed

STEPS TO SUCCESSFUL SIMULATIONS

Using a simulation in the classroom is easy to do well. And a simulation, like any other learning exercise, is worth doing well, quite aside from the fact that doing it badly is worse than not doing it at all.

STEP 1: A LITTLE PREPARATION

Prepare youself first. Then prepare the class.

Take time, a day or two before conducting a simulation, to review the materials thoroughly. Be sure you understand what steps are involved, and in what order. Simulations are usually self-contained, but check to be sure that nothing has been lost.

Simulations are especially effective as culminating experiences in study units. Sometimes they make effective introductions also. But ask youself, "Is there anything I should tell the participants before beginning the simulation?" Participants should know something about the issues involved, they should understand the scheduling for the simulation, and they should understand the instructions-especially their own role instructions. As coordinator of the experience, you are responsible for preparing them to this point.

STEP 2: ASSIGNING ROLES

There are two ways to assign participants to roles. One is to capitalize on the participant's strengths: for example, by assigning an activist to an activist role, or a "natural compromiser" to a role requiring compromise. Another is to use the simulation to help participants understand points of view-or develop behaviors-different from those they have held or employed. Generally it is a good idea to save this second type of assignment until the individual has had at least one successful simulation role-playing experience in a reinforcing role. In any case, it is a good idea to plan assignments beforehand. Make a list of role assignments in advance.

STEP 3: DURING THE SIMULATION

Don't leave a group unsupervised in a simulation. There are two reasons for this. First, many groups need occasional explanations of the rules of the simulation; and since simulations are timed activities, these explanations must not be delayed for even a few minutes. Second, most good simulations deal with volatile issues. Stay near, and, if necessary, remind the group, "This is only a game; you are only playing roles."

Don't interfere unnecessarily, however. Let the participants make their own decisions, and allow excitement to prevail-within limits. After all, it is the simulation's capacity to provide variety and to make learning exciting that caused you to use this method. Let it work.

STEP 4: COMPLETE THE EXPERIENCE

After the simulation has ended, talk about it-both about the issues involved, and about the gaming process itself. Conduct a structured discussion to place the participant's tentative conclusions into perspective. Be certain a learning experience has occured, not simply a gaming experience.

LESSON PLAN 4A Need for an Economic System
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 4 (NO.) LESSON: 1 (NO.) UNIT PERFORMANCE OBJECTIVE: 1, 6, 19 (CODE NO.) COMPETENCY VERIFICATION EV 4.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Explain basic economic problem and the need for an economic system in all societies

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
25	Chalkboard Films: Give & Take Series; #6, "Take Your Choice", #9, "We Choose" People on Market Street Series, or #4, "Scarcity and Planning" Dollars and Sense*, by Marilu Hurt McCarty, Ch. 1, pp. 1-17.	1. a. Discuss the basic problem of scarcity and the resulting need for choice (limited resources vs. unlimited wants)	1. a. Read chapter 1 in text; Dollars and Sense by McCarty. Join in discussion with this material.
		b. Select and show one of the "Choice" films	b. View film selected by teacher (see Col. 2). Discuss with teacher.
			c. Bring magazine/newspaper articles illustrating man's unlimited wants.
	*Or material on this topic from another approved textbook.		

LESSON PLAN 4A Need for an Economic System
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 4 (NO.) LESSON: 2 (NO.) UNIT PERFORMANCE OBJECTIVE: 1, 6, 19 (CODE NO.) COMPETENCY VERIFICATION EV. 4.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Explain basic economic problem and the need for an economic system in all societies; explore decision making.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
20	McCarty, pp. 17-22 Simulation, "Consumer Decision," by Edu-Game (copy in Berry CEE)	2. Problem-solving session: a. Ask questions What is nature of man's wants? Are they unlimited? Do they change over time? b. Brief students on simulation, monitor it, and debrief (See attached guide for use of simulations)	2. a. Join discussion and ask questions b. Participate in simulation c. Draw conclusions (debrief) about the lesson in the simulations

LESSON PLAN

4A Need for an Economic System
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 4 (NO.) LESSON: 3 (NO.) UNIT PERFORMANCE OBJECTIVE: 1, 6, 19 (CODE NO.) COMPETENCY VERIFICATION EV. 4.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Explain basic economic problems and the need for an economic system in all societies; the role of money and laws

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
15	McCarty, pp. 167-9	3. a. Discuss the barter system for acquiring needs, and the role of a system of exchange	3. a. Read pp. 167-9, McCarty.
(25)	Trade-Offs Film #9: "Why Money?"		b. View film and search for lessons in it.
(25)	Coronet films: (1) "Money: How It Functions" (2) "It's Only Money"	b. Select, brief, and show one of the "Money" films. c. Lead discussion on lesson of the film	c. Participate in discussion of film
20	McCarty, pp. 143-150, "Government Finance"	4. a. Lead discussion on government finance. b. Identify kinds of laws necessary	4. a. Read pp. 145-150, McCarty b. View film "Laws"
(30)	Film "Laws"--Whirlpool Corporation	c. Show, brief, and review "Laws" if time. If necessary, a portion of the next class period might be used to complete this important discussion on laws.	c. Write review of "Laws." Point out kinds of laws helpful in the economy.

LESSON PLAN 4B Three Basic Economic Questions
(TOPICAL OUTLINE CODE NO. AND TITLE) PAGE 1 OF 3

UNIT: 4 (NO.) LESSON: 4 (NO.) UNIT PERFORMANCE OBJECTIVE: 2,3,4,11,14,15 (CODE NO.) COMPETENCY VERIFICATION EV. 4.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Introduce three questions (What? How? For Whom?) facing each economic system and clarify how the market system determines what kinds of goods and services it will produce to meet the wants and needs of its members.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
15	Chalkboard or overhead projector Textbook, McCarty Local newspaper Regional or national newspaper	1. List the three questions facing all societies: a. What kinds of goods and services will be produced to satisfy societal wants and needs? b. How will those goods and services be produced? c. For whom will those goods and services be produced?	1. Read applicable text material (chapter 1, McCarty) and current materials, guided by teacher, related to our micro decisions
	McCarty, pp. 6-12		2. Identify: a. Our local and regional choices of production (use newspaper, magazine, economic reports, the Federal budget, others) b. Factors determining these choices (what resources are required for this production?) c. What sacrifices or opportunity costs are occurring as a result of those choices?
30	Data Retrieval Chart:	3. Complete the data retrieval chart for economic systems:	3. Read pages in textbook relating to "Economic Systems" (consult index of textbook)

System	Ownership of Property	Distribution of Income	Government Role	Economic Incentives
Traditional				
Command				
Market				

LESSON PLAN

4B Three Basic Economic Questions
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 2 OF 3

UNIT: 4 (NO.) LESSON: 4 (NO.) UNIT PERFORMANCE OBJECTIVE: 2,3,4,14,16,/17 (CODE NO.) COMPETENCY VERIFICATION EV. 4.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: (See page one)

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
(continuation within 30 minute timeframe)		4. Questions for discussion after completing data retrieval chart. a. What system would you prefer if you were (1) an average hard-working citizen, who just wanted a job to take care of your family? (2) the leader of a country rich in coal who wanted industry to get away from using imported coal? (3) the head of the agriculture department who needed to plan for enough food to feed the people of the nation? (4) a market analyst or businesswoman who had money and support enough to manufacture a new product? b. How would each of the economic systems on the chart determine what would be produced for its citizens, business, etc?	4. Join in class discussion of appropriate questions. 5. Problem solving: Construct and interpret graph showing Daily Bread Production at Country Kitchen Bakery (McCarty, pp. 14-15). 6. Think about and respond to question b, opposite. 7. Possible Research Activity (home work) Assume you're interested in establishing a bakery in your town. What are some things you would want to know before beginning? How would you gather that information? Prepare a market survey to find the answers that your target market might supply.

LESSON PLAN

4B Three Basic Economic Questions
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 3 OF 3

UNIT: 4 (NO.) LESSON: 4 (NO.) UNIT PERFORMANCE OBJECTIVE: 2,3,4,14,16,17/ (CODE NO.) COMPETENCY VERIFICATION EV. 4.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: (See page one)

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
10	Completed data retrieval chart	5. Demonstrate production possibilities, as on pages 9 and 10 of McCarty, Construct a graph, using problem, pages 14-15, McCarty.	

LESSON PLAN

4B Three Basic Economic Questions
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 4 (NO.) LESSON: 5 (NO.) UNIT PERFORMANCE OBJECTIVE: 2,3,4,11,14,15, 18 (CODE NO.) COMPETENCY VERIFICATION EV. 4.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Explain ways economic systems determine how they will combine available resources to produce the desired output; and demonstrate that when resources are used in one way, the system must sacrifice other goods and services those resources could have produced.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	 STUDENTS
20	Textbook, McCarty Chalkboard How We Organize to Do Business, paperback book published by American Institute of Cooperation 1800 Massachusetts Avenue, N.W. Washington, DC 20036 (one copy free)	1. Discuss a. resources needed for production generally: land, labor, capital, entrepreneurship (risk takers) b. how available technology in a community combines to make possible the production of particular goods or services (see list under Unit 4, B.2, "topics and subtopics") c. resources available for production of a particular good or service in this community (lead brainstorming session on this point); alternative uses to which those resources might be put; and what is sacrificed most when an alternative is chosen. d. identify in this community industries that are labor-intensive and those that are capital-intensive. 2. Lead a discussion on how we organize to do business (proprietorship, partnership, corporation)	1. a. Using the index of the textbook, read various sections listed under "Resources" and "Economic Growth" (these will be scattered throughout the text). b. Participate in discussion and brainstorming sessions. 2. Possible outside assignment: Interview a business executive in a large or small business to determine type of organization, product or service made, productive resources used and in what proportions, sources from which these productive resources come (ex., imported capital equipment, labor trained elsewhere, etc.) and effect of specialization on productivity. 3. Write a one-page paper on how the advancement of technology increases productivity, benefits the consumer, and stimulates economic growth.

LESSON PLAN

4B Three Basic Economic Questions
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 4 (NO.) LESSON: 6 (NO.) UNIT PERFORMANCE OBJECTIVE: 2,6,7,9,18,20 (CODE NO.) COMPETENCY VERIFICATION 4.1 and 4.2 (Budget Simulation) (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Explore the third question of economic systems--For whom will goods and services be produced, or who is to be rewarded?--and explain the importance of using our resources carefully for producing the goods and services we want most.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
15	Chalkboard	1. Engage class members in a discussion of individual needs--primary, secondary, and luxury--experienced by a. themselves, individually and collectively b. special groups, such as elderly people, professional people, young couples, etc. c. all people	1. Record personal needs (or wants) you satisfied through purchases within the last week, and the price you paid for each purchase.
20	Textbook, McCarty (or other selected textbook)	2. a. Discuss textbook material devoted to 1. the question, "For Whom?" 2. competition in the market, 3. governmental regulation in the market system and its effects on consumers and producers. b. Have students describe the relationship between 1. the profit motive, resource allocation, and distribution of income 2. profit motive and the rewards of risk taking.	2. a. Read text material as guided by teacher. b. Participate in discussion.
15	Personal budget forms	3. Direct class in personal budget preparation. Background exercise, pp. 17-20, McCa[illegible].	3. Complete at home, on form provided by teacher, a personal budget which will include the needs identified in #1. With each decision to allocate a portion of your income to a particular item or category, write on an accompanying sheet th[illegible]pportunity cost entailed. Subm[illegible] to teacher.

LESSON PLAN

4C Resources to Participate in the Market
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 4 (NO.) LESSON: 7 (NO.) UNIT PERFORMANCE OBJECTIVE: 4,8,9,10 (CODE NO.) COMPETENCY VERIFICATION 4.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE:

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
5	a. Chalkboard b. Dollars and Sense, McCarty	1. Review the factors or resources of production overviewed in lesson 5.	1. Review portions of textbook dealing with scarcity of resources, efficient use of resources, production possibilities.
5		2. Ask students to give their personal interpretations of the nature of work and its importance to individuals and to society.	2. Read Chapter 5, McCarty, "Labor Markets and the Labor Movement."
20		3. Explain a. demand for (derived demand) and supply of labor b. equilibrium wage and employment c. how specialization and division of labor affect productivity d. how value of labor resources increases through training e. role of the labor union in the U.S., its advantages and disadvantages f. role of the "creative" resource, or entrepreneurship, in combining resources toward a desired goal.	3. Share with class the results of interview with business person suggested in Lesson 5, item 2, for students. Point out especially the labor-intensive industries in the community.

LESSON PLAN

4C Resources to Participate in the Market
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 2 OF 2

UNIT: 4 (NO.) LESSON: 7 (NO.) UNIT PERFORMANCE OBJECTIVE: 4,8,9,10 (CODE NO.) COMPETENCY VERIFICATION 4.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE:

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
20	Trade-Offs Film No. 8 "Learning and Earning" and Teacher's Guide	4. Following suggestions in the Trade-Offs Teacher's Manual, brief and show film, "Learning and Earning"; debrief Alternate: 5. Simulation: The Sweet Home Pin Co. (labor game)	4. View film and participate in debriefing activities

LESSON PLAN

4C Resources to Participate in the Market
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 4 (NO.) LESSON: 8 (NO.) UNIT PERFORMANCE OBJECTIVE: 4,8,13,18 (CODE NO.) COMPETENCY VERIFICATION 4.1 and paper (See 3 below) (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Explain that capital, or manufactured resources are the tools and equipment of production and that construction of capital and postponed consumption are necessary to enable us to produce more goods in the future.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
30	Textbook, Dollars and Sense, McCarty	1. Explain a. "Manufactured" resources--capital--through use of which goods are produced; ("roundabout" production) 1. Tools 2. Equipment 3. Facilities b. relationship of shortages of capital to unemployment; c. payments to those who provide resources for use in production (salaries, rent, interest, and profits) d. effects of taxes and transfer payments on production e. land resources: their importance to particular industries; alternative uses.	1. Read McCarty, pages 6, 8, 22, 44, 217-219, 250, 256-257.
20	Trade-Offs Film No. 7 "Does It Pay?" (Investment in Capital Goods) Trade-Offs Teacher's Manual	2. Brief the film and show, "Does It Pay?" Debrief with questions from Teacher's Manual or simulation showing how use of calculator, once operator is trained, increases efficiency.	2. View film and participate in debriefing activities.
	Simulation on productivity comparing Calculator addition with pen-and-paper/mental addition.	3. Ask class how the productivity of land, labor, capital, and entrepreneurship determines the income to each of these factors.	3. Using background from this lesson and the interview suggested in Lesson 5, write a one-page paper on how advancement of technology increases productivity, benefits consumer, and stimulates economic growth.

LESSON PLAN

4C Resources to Participate in the Market
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 4 (NO.) LESSON: 9 (NO.) UNIT PERFORMANCE OBJECTIVE: 10,13,19,24 (CODE NO.) COMPETENCY VERIFICATION 4.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Explain the role of money in the economy, the circular flow of money, and the functions of banks and the Federal Reserve System, and the role of saving and investing.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
30	Dollars and Sense, McCarty	1. Explain a. functions of money in the U.S b. creation and destruction of money c. circular flow of money, goods and services in the economy d. importance of saving and investing to capital formation e. risks undertaken by entrepreneurs	1. Read textbook, McCarty, pages 167-69, pages 135, 172, 175-79, 181-83, 189, and 231 on money and money supply, and chapter 6, Measuring Economic Activity, pp. 107-120.
	Circular flow chart on chalkboard (See p. 108, McCarty)	2. Explain the role of the Federal Reserve System and banks. a. Ask students how changes in the money supply affect the utilization of our productive capacity. b. Invite bank resource person to talk about how banks serve industry and business to facilitate production.	2. Answer orally questions posed by teacher; ask questions.
	Federal Reserve Publications (free): The Federal Reserve System (Fed of Atlanta) The Story of Checks (Fed. of N.Y.)	3. Identify other sources of funds for financing businesses.	3. Help identify sources of funds.

LESSON PLAN 4C Resources to Participate in the Market

(TOPICAL OUTLINE CODE NO. AND TITLE) PAGE 2 OF 2

UNIT: 4 (NO.) LESSON: 9 (NO.) UNIT PERFORMANCE OBJECTIVE: 10,13,19,24 (CODE NO.) COMPETENCY VERIFICATION 4.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE:

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
	Trade-Offs Film No. 8 "Why Money?" or "The Role of the Federal Reserve System: The Credit System" (request from Atlanta Fed.)	4. Brief and show film, "Why Money?" or "The Role of the Federal Reserve System: The Credit System" Remind students of quiz tomorrow.	4. View film and discuss.

LESSON PLAN 4D Economic Relationships
(TOPICAL OUTLINE CODE NO. AND TITLE) PAGE 1 OF 2

UNIT: 4 (NO.) LESSON: 10 (NO.) UNIT PERFORMANCE OBJECTIVE: 5,15,17 (CODE NO.) COMPETENCY VERIFICATION 4.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Clarify the concepts of demand, its determinants and elasticity; factors that cause demand to change; the effect of price on the quantity demanded; develop student skill in depictive demand; and explored relationships between risk and profit security and loss.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
30	Returned test papers. Dollars and Sense, McCarty, chapter 2.	1. Discuss test results. 2. demand a. Define demand as the quantity of a product that would be bought at different prices in a given market within a given time period. b. Explain the law of demand c. Construct on chalkboard or overhead transparency a hypothethical demand schedule for a product suggested by students. Students construct individual schedules; combine to form market demand. d. Transfer the market demand schedule to a large chart on the board. e. List determinants of demand on chalkboard. f. Define elasticity of demand; show by chart the difference between price elastic and price inelastic demand. g. Explain determinants of elasticity.	1. Read textbook 2. a. Participate in formulation of demand schedule for product selected by class. b. Record demand graphs as they are presented on chalkboard. c. Identify goods, the demand for which is 1. price elastic 2. price inelastic

LESSON PLAN

4D Economic Relationships
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 2 OF 2

UNIT: 4 (NO.) LESSON: 10 (NO.) UNIT PERFORMANCE OBJECTIVE: 5,15,17 (CODE NO.) COMPETENCY VERIFICATION 4.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE:

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
10	Chalkboard paper and pencil	3. Demonstrate by graphing what happens to the Demand curve when demand changes, and how changes in demand differ from quantity of a good demanded. a. Change in price affects quantity demanded. b. Changes in any of the determinants of demand cause changes in demand and shifts in the curve.	3. Follow instructions in graphing changes in demand.
10	Business section of current newspaper.	4. Discuss relationships between and implications of risk-taking and profit possibilities; maintaining security and possibly incurring losses. How can one minimize one's losses? Give examples from current newspaper.	4. Participate in discussion.

LESSON PLAN

4D Economic Relationships
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 4 (NO.) LESSON: 11 (NO.) UNIT PERFORMANCE OBJECTIVE: 5,15,16,17 (CODE NO.) COMPETENCY VERIFICATION 4.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Clarify the concept of Supply, its determinants, the difference between supply and the quantity supplied; explore fixed and variable costs of a firm, and the concept of marginal cost, and develop skill in depicting supply graphically.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
30	Dollars and Sense, McCarty, chapter 3 Chalkboard or overhead transparency, paper and pencils	1. Supply a. Define supply as the quantity of a good or service that would be offered for sale at different prices within a given time period. b. Explain the law of supply and factors that affect supply. c. Ask students to construct an individual supply schedule for the product suggested by the class yesterday. Combine these into a schedule for market supply. d. Explain difference between supply and quantity supplied (Change in price causes change in quantity supplied) e. Demonstrate graphically how the supply curve moves in response to changing factors affecting supply.	1. Read textbook. a. Participate in formation of supply schedule for product selected by class. b. Record supply graphs as they are presented on chalkboard. c. Transfer supply curve to graph containing demand curve from yesterday.
10	Chalkboard pencil and paper	2. Explain equilibrium price and illustrate with S & D graphs depicting product selected by class.	2. Record S & D graph for product selected and indicate the market equilibrium point.

LESSON PLAN

4D Economic Relationships
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 2 OF 2

UNIT: 4 (NO.) LESSON: 11 (NO.) UNIT PERFORMANCE OBJECTIVE: 5,15,16,17 (CODE NO.) COMPETENCY VERIFICATION 4.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE:

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	McCarty, "Theory in Practice," pp. 55-61.	3. Identify cost factors entering the price structure, and determine if variable or fixed. (Refer to list in Section D of Unit Titles). Ask students what some of these factors are.	3. Read text and participate in discussion.
5	Instructional sheet for "The People on Market Street" series.	4. Introduce students to films for Lesson 12: Demand, Supply, Market Clearing Price	

LESSON PLAN 4D Economic Relationships
(TOPICAL OUTLINE CODE NO. AND TITLE) PAGE 1 OF 1

UNIT: 4 (NO.) LESSON: 12 (NO.) UNIT PERFORMANCE OBJECTIVE: 5, 17 (CODE NO.) COMPETENCY VERIFICATION 4.2 (paper for submission) (EV CODE)

LESSON OBJECTIVE OR PURPOSE:

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
50	Films from "The People on Market Street" series": "Demand" "Supply" "Market Clearing Price" (Available from Georgia Council on Economic Education)	1. Introduce and show the three films. 2. In lieu of the "Demand" and "Supply" films, have class engage in three rounds of the simulation "The Big Apple" (contained in Workshop Manual for Trade-Offs Series) or "Market" (Georgia Council on Economic Education) 3. Show "Market Clearing Price."	1. View films and analyze them. 2. Submit a one-page paper tomorrow on the relation between price and quantity of goods demanded and supplied. Support your explanation with a graph.

LESSON PLAN

4E Effects of Government Regulations, Laws, Activities
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 4 (NO.) LESSON: 13 (NO.) (14th day) UNIT PERFORMANCE OBJECTIVE: 20, 21, 22,25 (CODE NO.) COMPETENCY VERIFICATION EV 4.2 & paper (EV CODE)

LESSON OBJECTIVE OR PURPOSE: To explain laws, regulations, and government activities that affect the economy, both nationally and internationally.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	 STUDENTS
10	Chalkboard Dollars and Sense, by McCarty Chapters 8-11, 13-14. Current newspapers with national and international news	1. Identify and explain the purpose of laws that a. protect savings (FDIC) b. control extensive growth of business that might become detrimental (antitrust) c. protect consumers	1. Read applicable textbook chapters.
15		2. Explain government fiscal policy-spending and taxation a. ways government finances expenditures b. types of taxes c. government spending components 1. national 2. local	2. Bring newspaper articles about the level of government spending in various programs. Relate these to the national debt.
5	NOTE: This lesson has much material which the teacher may elect to "share" with, or extends into surrounding lessons.	3. Review briefly (from a previous lesson) monetary policy and its role in economic stabilization.	3. Explain in a panel discussion how economic specialization promotes foreign trade and world interdependence.
10		4. Define GNP, how it is calculated, and how its growth is measured.	4. Submit a one-page paper on how governmental expenditures and taxation policies affect inflation and employment.
10		5. Explain the concepts of free trade, balance of trade and payments, barriers to trade, and foreign exchange.	

LESSON PLAN

4F Functional Parts of a Corporation
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 4 (NO.) LESSON: 14 (NO.)(15th day) UNIT PERFORMANCE OBJECTIVE: 15 (CODE NO.) COMPETENCY VERIFICATION EV 4.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Define the American corporation and explain the role of the stockholders, the board of directors, and management in it.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	 STUDENTS
20	How We Organize to Do Business in America (free) American Institute of Cooperation 1800 Massachusetts Ave., NW Washington, DC 20036 Cooperatives in the American Private Enterprise System (free) Farmer Cooperative Information U.S. Dept. of Agriculture Washington, DC 20250	1. Describe a. the investor-owned corporation b. the member /user-owned cooperative corporation, each on 1. owners of the business 2. users of the services 3. who votes 4. how voting is done 5. who determines policies 6. whether returns on ownership capital are limited 7. who gets the operating proceeds 8. determination of prices	1. Read the two booklets listed under "resources."
20		2. Explain role of a. Stockholders b. Board of Directors c. Management d. Labor	2. Identify and report to class orally on investor-owner corporations and member/user-owned cooperative corporations in the community. Tell the types of products they produce or market.
10		3. Ask for class member input on Activity 2. List these on the board.	

LESSON PLAN

4F Functional Parts of a Corporation
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 4 (NO.) LESSON: 15 (NO.) (16th day) UNIT PERFORMANCE OBJECTIVE: 14, 15 (CODE NO.) COMPETENCY VERIFICATION EV 4.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: To observe directly through field trip to a corporation, or vicariously by film and observations by management, the structure and functioning of a modern corporate enterprise.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
Entire period and possibly an extra for travel	"Checklist of Steps for Field Trips to Economic Enterprises" by George Fersh (appendix) Transportation for Class Or if field trip not taken,	1. Take class to a local corporation where members of management and labor, by prearrangement, will explain the organization of the corporation and their respective roles in it. Observe the intensity of use of labor and technology in the firm, and other economics principles at work, as delineated on the checklist.	1. Prepare for field trip with background information on the corporation and list of questions to be asked.
	"The Modern Corporation" Georgia State Department of Education State Film #7895 28 minutes. and Local Corporation executive to speak	or 2. Introduce and show film, "The Modern Corporation."	2. Follow up with a written summary of the field trip and the "economics at work" you observed. Plan to share your thoughts with the class tomorrow. Present paper to teacher.
		3. Follow film with comments and elaboration by a local corporation executive.	3. Make notes on the corporate executive's comments.

LESSON PLAN

4G Comparison of American Free Enterprise Economy With Other Systems
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 4 (NO.) LESSON: 16 (NO.) (17th day) UNIT PERFORMANCE OBJECTIVE: 7, 12, 23 (CODE NO.) COMPETENCY VERIFICATION EV 4.1 and EV. 4.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: To compare the free market with those operating under socialism, communism, and fascism.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
	Dollars and Sense, McCarty Film Options: "Man's Material Welfare" Amway Corporation (about 30 minutes) "Spirit of Enterprise" State Film #4473 (13 min.) "Capitalism and Communism" BFA Education media (21½ minutes)	1. Compare and contrast the free market system, "laissez faire," with a. socialism b. communism c. fascism	1. Read segments of the text, found in index, devoted to each of the economic/political systems listed. Research further in library.
		2. Show selected film and discuss its message in relation to analysis in item 1.	2. Participate in discussion on message and implications of the film.

LESSON PLAN 4H Inflation
(TOPICAL OUTLINE CODE NO. AND TITLE) PAGE 1 OF 1

UNIT: 4 (NO.) LESSON: 17 (NO.) (18th day) UNIT PERFORMANCE OBJECTIVE: 26, 27 (CODE NO.) COMPETENCY VERIFICATION 4.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE:

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
30	Dollars and Sense, McCarty, chapter 10 Current newspaper for articles on inflation	1. Define inflation a. cost-push b. demand-pull c. structural inflation and stagflation d. regulation inflation	1. Read text, chapter 10.
10		2. Guide class discussion on which costs push up prices--labor or capital? How can, or should, we determine fair income shares? (Point out that wages must rise for goods and services to be sold.)	2. Participate in class discussion.
10		3. Discuss current news items relating to the impact of inflation on personal and business decisions.	3. Report on current news item presenting problems (or benefits) related to inflation. (Ex., new union contract with large wage increases)

LESSON PLAN

4I Recession; 4J Depression
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 4 (NO.) LESSON: 18 (NO.) (19th day) UNIT PERFORMANCE OBJECTIVE: 20 (CODE NO.) COMPETENCY VERIFICATION EV 4.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: To distinguish between recession and depression, and identify possible causes and corrective measures.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10	Dollars and Sense, McCarty Inflation and/or Unemployment Booklet from Federal Reserve Bank of Philadelphia PA, 1910, (free)	1. Discuss characteristics of a. recession b. depression	1. Read segments of the text related to recession and depression and related government controls.
30		2. Explain background, events, and outcomes of the Great Depression.	2. Study about the Great Depression, using various sources.
10		3. Generate ideas from the class on possible ways of dealing with problems of recession and depression. Summarize by identifying typical government controls and their effects. 4. Announce test follows next day.	3. Contribute idea to the class discussion.

LESSON PLAN

4. Free Enterprise Competency Verification
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 4 (NO.) LESSON: 19,20 (NO.) UNIT PERFORMANCE OBJECTIVE: 4.1 - 4.27 (CODE NO.) COMPETENCY VERIFICATION EV 4.1; 4.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to demonstrate competencies related to the free enterprise system.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
10	Test EV. 4.1 for class distribution	1. Review competencies which will be tested.	Listen Ask questions
35		2. Administer test EV. 4.1	Respond to questions
5		3. Clarify understanding	Ask questions
10		4. Review competencies to be tested	Listen Ask questions
35		5. Administer test EV. 4.2	Respond to questions
5		6. Clarify understanding	Ask questions

EV 4.1

Possible responses follow each question in parentheses.

1. Explain the basic economic problem facing all societies.
(Wants are theoretically unlimited and resources to satisfy wants are limited; therefore, choices must be made as to the use of the resources and the satisfaction of wants.)

2. What three questions face each society? How have we organized to solve those questions?
(The questions are What, How, and For Whom output is to be produced. We have organized into a relatively free market system in which the demand of those wanting the goods or services guides those who organize to produce in their determination of what to produce and the combination of resources with which to produce. Decisions are made essentially by suppliers and users, not by government, and prices are set in the market.)

3. How are natural, human, and capital resources related to human needs and wants?
(To produce goods or services such as transportation to satisfy human needs and wants, various combinations of the three groups of resources are required. For example, production equipment, labor, and land are required before an auto factory can go into production and, after that, to continue producing to meet demand.)

4. Explain how specialization permits scarce resources to be more efficiently used. Why is specialization important to both domestic and international activity?
(Adam Smith's story of a pin factory showed that when workers were assigned specific subtasks on an assembly line, they could produce many times more pins than if each concentrated on producing finished pins. Frederick Taylor and Frank Gilbreth expanded the concept of specialization by breaking down jobs into simple operations requiring little training or effort. Henry Ford applied this concept in his first auto assembly lines. Specialization enables societies to produce not only the necessities but some of the luxuries of life. If countries specialize in those goods for which they possess the best resources, more can be produced at less cost than if everybody produces everything, and by trade wants and needs can be met.)

5. Describe the characteristics of the free enterprise, or market, system.
(By their own choice producers who are willing to take a risk decide to establish factories or businesses to make or sell goods and services wanted or needed by consumers. In doing this, producers use the resources of production at prices which will buy those resources--land, labor, capital. Consumers by their own choice enter the market to buy goods and services, based upon their tastes or preferences or ability to buy. This combination of supply and demand is the model of the market for a particular good or service. This model is used to determine the actual price and quantity sold of a particular good or service.)

6. Tell how the profit motive helps determine resource allocation and distribution of income, and explain the relationship of the profit motive to risk taking.
(Entrepreneurs are willing to take a risk that demand will enable them to sell at a profit what they are able to produce. Producers must, of course, take into consideration the nature of demand and use combinations of resources (raw materials of quality needed, methods of combining them into a finished product the consumer will want and buy) that are acceptable. Producers pay for these resources which they buy from the household and business sectors. In return, those who sell the resources receive income in the form of rent, wages, interest, and profits. The circular flow chart demonstrates this activity. The rewards for risk taking are profits, or income above costs.)

7. List several (3-4) sources of funds for financing business enterprises.
(Entrepreneur's or partners' funds, sale of stocks or bonds, commercial banks, venture capital institutions, other financial institutions, government)

8. Explain the role of competition in the private enterprise system and show its benefits to consumers).
(With competition, there are several or many buyers and sellers in the marketplace to satisfy the varied needs and wants of consumers. Buyers are able through seeing or reading the advertising of these producers to determine what is available to satisfy their needs and wants. These sellers can move in and out of the market, as need dictates. If buyers aren't responding to the seller's offer, the seller may of necessity give in to his competition. Buyers must be able to seek the lowest prices and sellers the highest prices for their goods. When markets are free and competitive, society will achieve the largest output from its limited resources. Consumers evaluate the usefulness of goods and services and buy if they determine the goods and services will meet their needs and are priced at an acceptable level.)

9. What role do saving and investing play in capital formation? What is their significance to levels of production and economic growth?
(Business spending for plants, productive equipment, and inventory is investing. Saving is necessary, first, in order to invest in capital resources to improve production. To save and invest requires sacrifice. Economic growth can occur when conditions such as basic health and education and desire of workers to improve their status in life exist and investment makes expansion possible. As technology and worker capabilities improve, productivity increases and workers are free to develop other resources. Thus growth occurs.)

10. Describe the role of money and effects on economic activity of decreasing or increasing the quantity of money in a private enterprise economy.
(Money serves as a medium of exchange that's accepted for payment for goods and services. It is also a standard of value; that is, it provides a means for determining value. It is also a store of

value and can be saved for future use. The effect of decreasing or increasing the quantity of money in the economy is to reduce the amount of borrowing and other economic exchange that can take place, or increasing it, as the case may be.)

11. Describe the structure of the Federal Reserve System. What are its main functions with regard to monetary policy?
(The Federal Reserve system, which regulates commercial banks, is controlled by a seven-member Board of Governors appointed by the President with Senate approval. Federal Reserve banks are situated in twelve Federal Reserve districts. They deal with the Treasury and with commercial banks, not with the public. Federal Reserve banks hold deposits, or reserves, for commercial banks and act as bankers for the U.S. treasury, holding tax revenues and paying the bills of the U.S. government.

Monetary policy involves control of the supply of money to meet the nation's needs for purchasing power and affect business investment spending. The Fed has three ways to influence the supply of money. These methods work mainly by changing the level of checking accounts in commercial banks. The level of checking accounts is changed by changing a bank's ability to make loans and create new demand deposits. The Fed can (1) change required reserves held in the Federal Reserve by banks; (2) raise or lower the discount rate on borrowed reserves from the Fed; (3) sell U.S. government bonds in the open market.)

1. Distinguish between pure competition, monopoly and oligopoly. Tell types of firms in each structure, types of products, level of competition, and how price is determined.

(In true competition many small firms produce identical products. The price these firms command is an equilibrium price which the firm itself is too small to affect. In reality, the firm's supplying a better product or service at a comparable price to others' will determine how successfully that firm competes. Producers of low-cost or relatively low-cost consumer goods or industrial supplies are likely in this category.

Monopoly--only one large seller in a market. The monoploy can maintain control over supply and will try to increase demand so that there will be buyers at profitable prices. Groups of noncompeting firms with power to affect price perhaps best describes monopoly. Included are utilities, which are controlled monopolies.

Oligopoly, more common than monopoly in the U.S., is an industry in which a few large, independent firms supply most of industry output. Small firms may be found in particular markets, however. Oligopoly is usually found in industries requiring large capital investment. Results are often similar to monopoly. The firms arrive at similar price and quantity decisions, even without actual agreement. The automobile, steel, and meat-packing industries are examples.

Monopolistic competition exists when each individual firm claims to offer a product that is distinctly unique, like the only soft drink. Products are very similar, but producers try to make them seem different. Monopolistic competition is similar to competition because there are many firms in the industry, and include retail trade and personal service industries.

Summary: Monopoly--one seller; difficulty in entering, unique product, influence over price, higher price, lower quantity.
Oligopoly--few sellers; not very easy to enter; homogeneous or differentiated product; price leadership; somewhat higher price and lower quantity.
Monopolistic Competition--many sellers; ease of entry; differentiated product; little influence over price; slightly higher price; frequently excessive quantity.)

2. Explain the relation between price and quantity of goods demanded and supplied.

(In free markets the interaction of demand and supply determines the price of a good. For example, many consumers enter the market to purchase tapes, and many suppliers respond by offering tapes for sale. Producers and consumers must agree on a market price for the tapes. Equilibrium is reached when the price is established at which all the tapes offered for sale are bought. This can be demonstrated on a graph. [Teacher may give demand and supply schedules which student may graph and show point of equilibrium, shortage, and surplus.])

3. What are the effects of government regulation on consumers and producers in the economy?

(Government regulation may take various forms. Government intervention in areas like price setting may benefit particular groups at the expense of others. Results can be reduction of efficiency in the economy overall. A price ceiling can cause a shortage; a price floor, a surplus. Free market prices help ensure economic efficiency in the use of scarce labor and other resources: to produce the most of what we want with the least use of resources.

Government regulatory policies may add to costs of production and keep many prices higher than free market prices; however, there are some benefits associated with regulation.

Government regulation has two objectives usually: economic or social. The economic objective is primarily to protect competition in particular industries.

The social objective is to protect workers and consumers. In both cases the result may be to raise prices. Regulation for economic purposes is usually directed to a particular broad sector of the economy like agriculture, transportation, or communication. The goal of regulation here is to retain a degree of competition to avoid the harmful effects of monopoly.

Social regulation causes firms to include external costs, normally paid by others, outside the firm (ex., employee health aid safety), in their costs of production. The costs and the benefits are spread over the entire community. Administering rules is also very costly, and the result of all this is to raise prices.)

What is the rationale for the Federal government's role in helping stabilize the economy?

(The government uses fiscal policy to help guard against inflation and unemployment and their deleterious effects on the economy. Tax structure and government spending enter into fiscal policy. The progressive income tax has a stabilizing effect on consumption. It also helps prevent widespread unemployment of the nation's productive resources. The tax structure helps cushion the effects of a drop in spending because reduced incomes are taxed at lower rates, and transfer payments increase as more families move down the income scale, creating more purchasing power in lower-income groups. This cushions the downward slide of spending and helps keep employment and production from falling as much as it might.

If spending rises too rapidly, the tax structure helps dampen the effects of a jump in spending. Families moving into higher tax brackets are taxed at higher rates, and they receive fewer transfer payments. This draining of excess purchasing power tends to help hold prices down.

If the automatic fiscal policy isn't adequate, the government may engage in discretionary fiscal policy either to expand or contract spending. Expansionary fiscal policy helps guard against high unemployment. Contractionary fiscal policy helps guard against or soften inflation.)

Match the items in list A to those in List B:

List A

A. Traditional Economy
B. Command Economy
C. Market system

List B

(B) 1. Central authority decides priority of needs
(A) 2. Succeeding generation continues same patterns of production/distribution as ancestors
(A) 3. Resources are probably few
(B) 4. National goals important
(C) 5. People plan production and distribution
(C) 6. Expectation of profit
(B) 7. Government owns means of production
(C) 8. People vote with their $
(A) 9. Found in Africa, Asia, and Latin America
(B) 10. USSR is an example
(C) 11. Receipt of profits by the firm provides funds for investment
(B) 12. Government determines major focus of the economy and what will be done with its income.

6. What does Gross National Product measure?

(Gross National Product is the final value of all goods and services produced for sale in a given year, and final goods and parts produced for inventories to be sold in later years. This measure leaves out intermediate goods, sales of goods produced in previous years, stocks and bonds [they're not goods or services], or sales of unimproved land. Government transfer payments aren't included either. GNP can be measured as either output or income. As output, it is the sum of spending flows in all product markets, and represents total demand in the economy [C + I + G]. As income, it is the total income from production of goods and services. It is also the sum of income flows in all resource markets [w + r + i + p + business taxes and savings].

In sum, aggregate D [output] = Aggregate S [income].)

(EV 4.3)

NAME: ______________________ DATE: ______________

UPO 4.11

EVALUATION OF TERM PAPER/WRITTEN REPORT

	DONE VERY WELL	SATIS-FACTORY	MORE WORK NEEDED	NOT APPLI-cable
A. CONTENT				
1. Covered chosen subject thoroughly				
2. Major points well organized				
3. Purpose of paper made clear				
4. Conclusion or summary well thought out				
B. FORM/GRAMMAR				
1. Outline done according to accepted form				
2. Acceptable punctuation and spelling				
3. Sentences and paragraphing clear grammatical construction				
4. Quotation and citations done properly				
5. Footnotes done according to accepted form				
6. Bibliography done according to accepted form				
C. RESEARCH TECHNIQUE				
1. Good variety of source material				
2. Authorities given to substantiate opinions				
3. Paper shows writer has done ample reading on the subject				

(EV 4.4)

NAME: ______________________ DATE: ______________

UPO 4.27

EVALUATION OF TERM PAPER/WRITTEN REPORT

	DONE VERY WELL	SATIS-FACTORY	MORE WORK NEEDED	NOT APPLI-cable
A. CONTENT				
1. Covered chosen subject thoroughly				
2. Major points well organized				
3. Purpose of paper made clear				
4. Conclusion or summary well thought out				
B. FORM/GRAMMAR				
1. Outline done according to accepted form				
2. Acceptable punctuation and spelling				
3. Sentences and paragraphing clear grammatical construction				
4. Quotation and citations done properly				
5. Footnotes done according to accepted form				
6. Bibliography done according to accepted form				
C. RESEARCH TECHNIQUE				
1. Good variety of source material				
2. Authorities given to substantiate opinions				
3. Paper shows writer has done ample reading on the subject				

INSTRUCTIONAL PLAN

UNIT FIVE

5	Manufacturing (Free enterprise in action)	
	A. Introduction	8 weeks total
	1. Plans to simulate a corporate production enterprise 2. Value or role playing 3. Kinds of products or services acceptable 4. Alternative plans for funding and operation, liquidation of assets and profits, or realization of losses acceptable to the school and community	1 day
	B. Major corporate organization and roles (review) 1. Stockholders 2. Management team a. Engineering-design b. Sales c. Production d. Accounting 3. Labor - worker's union 4. Election or assignment of roles	1 day
	C. Holding Stock holders meetings 1. Minutes kept 2. Parlimentary procedure followed 3. Company charter a. By-laws b. Company name selection c. Application for charter procedures	1 day
	D. Selecting company product or design 1. Fulfill a need or desire 2. Compatible with skills, equipment, and other resources 3. Safe to use, store, etc. 4. Marketable a. Market surveys b. Rough price estimation 5. Patent protection and infringement	4 days
	E. Capital formation for enterprise 1. Selling common stock 2. Selling perferred stock 3. Loans 4. Collateral - assets 5. Records - stock certificates 6. Estimating funds necessary	2 days

5 Manufacturing (Free enterprise in action) (Cont.)

- F. Corporate, accounting — 1 day
  - 1. Accounts receivable
  - 2. Accounts payable
  - 3. Purchasing procedures
  - 4. Invoicing procedures
  - 5. Financial status report
- G. Setting up for production — 10 days
  - 1. Working drawings of product
    - a. Pictorial and dimensioned orthographic views
    - b. Bill of materials containing material specifications
  - 2. Construction of prototype model
  - 3. Analysis of operations to be performed
    - a. Operations list
    - b. Material flow chart
    - c. Production floor plan showing locations or work stations
    - d. Numbers and titles of workers
    - e. Quality control points
  - 4. Preparing work stations
    - a. Proper tooling
    - b. Special set ups with existing equipment
    - c. Jigs and fixtures
      - (1) Design
      - (2) Construction
      - (3) Installation
      - (4) Safety
      - (5) Testing
    - d. Temporary storage of work pieces at stations
    - e. Transportation of work pieces from station to station
    - f. Hiring and training of workers
      - (1) Overall understanding of production plan
      - (2) Safety rules and hazards
      - (3) Specific task procedure
        - (a) Source of work piece(s)
        - (b) Operations performed
        - (c) Quality control checks
        - (d) Location or disposal of finished task pieces

5 Manufacturing (Free Enterprise in action) (Cont.)

- H. Board of Directors Meetings - Typical Agenda (used in simulation) 3 days
  - 1. Call to order
  - 2. Reports
    - a. Manufacturing
    - b. Sales
    - c. Treasurer
    - d. Presidential summary
  - 3. Old business
  - 4. New business
  - 5. Program (optional)
    - a. Guest speakers
    - b. Field trips
    - c. Outside salesman
    - d. Leadership training
    - e. Informal discussion
  - 6. Adjournment
- I. Manufacturing production operation 4 days
  - 1. Specified materials available in proper locations
  - 2. Workers at stations
  - 3. Worker rotation or reassignment
  - 4. Supervisors oversee work
  - 5. Safety precautions observed
  - 6. Quality control points are monitored carefully
  - 7. Production rates
  - 8. Breakdowns, line stoppages
    - a. Cost in time
    - b. Cost in lost labor
  - 9. Worker suggestions
  - 10. Worker grievences
- J. Labor Unions 3 days
  - 1. Purpose (review)
  - 2. Formation
  - 3. Protections and controls by Federal Law
  - 4. Operation
    - a. Collect dues
    - b. Elect officers
    - c. Negotiate a contract
    - d. Sponsor a social-fellowship event for workers
    - e. Represent workers with a grievence
- K. Selling the product 3 days
  - 1. Advertising

5 Manufacturing (Free Enterprise in action) (Cont.)

2. Direct sales
    a. Attract positive curiosity or attention
    b. Establish common communication bond
    c. Stimulate interest in the product
    d. Create desire or awaken awareness of need
    e. Ask for an order
    f. Close the sale
        (1) Agree upon acceptance of money or checks
        (2) Agree upon delivery arrangements
        (3) Thank the customer
    g. Ask for a referral
3. Wholesale - distributor operations
4. License, permit, local regulations

L. Liquidation of the company — 3 days
1. Assets to cash
    a. Sales of product
    b. Auction remaining assets
        (1) Special tools
        (2) Jigs - fixtures
        (3) Raw materials
        (4) Unsold product
2. Payoff of obligations
    a. Outstanding bills
    b. Final payroll
    c. Commissions
3. Preparation of final balance statement
    a. Declaration of profit
    b. Declaration of loss
4. Division of cash to stockholders with liquidation report
5. Bankruptcy concepts

UNIT PERFORMANCE OBJECTIVES

UNIT FIVE

UNIT PERFORMANCE OBJECTIVES		EVAL INSTRUMENT CODE
UNIT 5	Manufacturing (Free Enterprise Simulation)	
5.1	Students will be able to discuss and explain the function of role playing in the learning process as it relates to them individually and the class as a whole and be willing to freely participate in this learning activity. Degree of achievement in this activity will be evaluated by instructor observation of participation and student self rating scale.	EV 5.1
5.2	Students will be able to answer questions regarding the formation of a corporation, the functions of stock holders and corporate officers and the manner in which overall policy is established and approved (charter granted) with 80% accuracy.	EV 5.2
5.3	Students will be able to identify at least 3 of the factors which are considered in the process of selecting a product to be manufactured.	EV 5.2
5.4	Students will be able to identify at least 2 ways of accumulating capital for corporate operation.	EV 5.2
5.5	Students will be able to make, interpret, or modify working drawings of a product to the satisfaction of the instructor and fellow workers. Competency will be judged by performance on at least one drawing assignment related to the product and the satisfactory performance of a production role following the approved plans.	EV 5.3
5.6	Students will be able to identify a logical sequence of operations needed to produce a simple product when asked to do so on a written test.	EV 5.4

UNIT PERFORMANCE OBJECTIVES

UNIT 5 Manufacturing (Free Enterprise Simulation) (Cont.)

5.7	Students will be able to describe the contributions of the concepts of interchangeable parts, the assembly line, material and product flow, division of labor quality control and jigs and fixtures to the mass production operation on a written test.	EV 5.4
5.8	Students will be able to perform manipulative production operations as assigned in the production simulation. Performance will be checked by students assigned to quality control and checked by observation to the satisfaction of instructor.	EV 5.5
5.9	Students will be able to identify the normal functions of a labor union associated with a production enterprise.	EV 5.4
5.10	Students will be able to perform the usual functions of a retail salesperson, presenting the sales opportunity, collecting and accounting for money, arranging for pick up or delivery. Competence will be evaluated from student sales reports and observations of instructor.	EV 5.6
5.11	Students will be able to identify at least 2 ways in which a corporation is terminated on a written test.	EV 5.4

LESSON PLAN

5.A.1-4 Introduction to Manufacturing - Corporate Simulation
(TOPICAL OUTLINE CODE NO. AND TITLE)
PAGE 1 OF 2

UNIT: 5 (NO.) LESSON: 1 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.1 (CODE NO.) COMPETENCY VERIFICATION EV 5.1;5.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be motivated to simulate career roles in a manufacturing enterprise. They will be able to explain the value of role playing.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10	Action Company Guide 1972, Community Resources Corporation 3333 East 32 Place, Tulsa, OK 74135 Suggested blank Charter follows lesson plan	1. Announce the plan to simulate a manufacturing company 2. Explain the value of role playing as a learning experience 3. Display blank charter and explain function of the charter in authorizing a corporation to form and operate	Listen
10	Examples or pictures of acceptable projects as in pages 173-176 in Manufacturing, Fales, Sheets, Mervich, and Dinan	4. Lead a discussion and answer questions regarding the following possibilities, But do not lead into definite decisions A. Kinds of products which can be manufactured B. What to do with company profits or loses. (check local school policies ahead of class)	Participate in discussion Ask questions
10		5. Lead a brainstorm suggestion on what to call the company - a name	Make suggestions

LESSON PLAN (CONTINUED):

UNIT NO. 5

LESSON NO. 1

PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
20		6. Assign students to read Chapter 8, "Starting and Organizing Manufacturing Companies" in the Manufacturing text.	Start reading

CHARTER

ISSUED TO

____
(NAME OF COMPANY)

CONDUCTING BUSINESS AT

____
(SCHOOL)

INDUSTRIAL ARTS DEPARTMENT

*This Charter authorizes students of the ___ period industrial arts class to form a simulated Corporation, raise funds for operation, transact business, produce a product, market the product, and liquidate the Corporation by ________.
(date)

CORPORATE OFFICERS

PRESIDENT	______________	SECRETARY	___________
VICE PRESIDENT	______________	TREASURER	___________

*Corporate actions must be approved by instructor and/or proper school officials

LESSON PLAN

5.B. Review of Corporate Organization - Election of Corporate Officers
(TOPICAL OUTLINE CODE NO. AND TITLE) PAGE 1 OF 3

UNIT: 5 (NO.) LESSON: 2 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.2 (CODE NO.) COMPETENCY VERIFICATION EV 5.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will review the process and roles of corporate formation and form the class into a production corporation with election of officers and further role definition and assignments.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
15	Organization chart, Fig 8-12, Page 111 of Manufacturing by Fales, et al.	1. Review the position and leadership roles needed in the organization through lecture and questioning A. Stockholders - every class member will become stockholders. B. Management is made up of a Board of Directors elected from among the stockholders (1) Chairman of the Board (2) Secretary of the Corporation (3) Treasurer of the Corporation (4) Two representatives at large elected from the class. C. Administration (Appointed or "hired" by the Board) (1) President (2) Vice-president - personnel	Listen Answer questions

LESSON PLAN (CONTINUED): 5 UNIT NO. 2 LESSON NO. PAGE 2 OF 3

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
		(3) Vice-president - Research and Dev. (4) Vice-president - production (5) Vice-president - marketing Note: In any corporation one individual can and often does hold both management and administrative titles and/or positions (6) Workers - all class members as assigned. One individual may hold several "jobs" before the simulation is finished.	
5		2. Lead class in election of Chairman of the Board	Participate in election
15		3. Chairman of the Board will conduct election of secretary, treasurer and member at large	
15	Blank charter	4. Assign board members the following tasks. A. Fill out Charter for approval by Stockholders and teacher	

LESSON PLAN (CONTINUED):

UNIT NO. 5

LESSON NO. 2

PAGE 3 OF 3

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	 STUDENTS
	Blank organization chart	B. Recommend appointments among class members for administrative positions	Complete charter Fill in organization chart
		C. Develop an agenda for conducting a report to stockholders the next day. Agenda should include (1) Recommendation approval of company name, charter, and by-laws. (2) Recommend for approval the assignment of administrative officers (3) Recommend for approval the sale of formation stock (common) at $.25 a share to each class member	Plan the agenda Prepare formation stock certificate

COMMON STOCK CERTIFICATE*

______________________ (SCHOOL)

______________________ (DATE)

______________________ (COMPANY NAME)

ISSUED TO: ______________________ (STUDENT'S NAME)

FOR: $__________ (PRICE)

This certifies that the above student owns one share of stock in the simulated company formed in the __________ (period) industrial arts class.

*Non-transferable

______________________ (Company Treasurer)

COMMON STOCK CERTIFICATE*

______________________ (SCHOOL)

______________________ (DATE)

______________________ (COMPANY NAME)

ISSUED TO: ______________________ (STUDENT'S NAME)

FOR: $__________ (PRICE)

This certifies that the above student owns one share of stock in the simulated company formed in the __________ (period) industrial arts class.

*Non-transferable

______________________ (Company Treasurer)

LESSON PLAN

5.C. Stockholders Meeting
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 5 (NO.) LESSON: 3 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.2 (CODE NO.) COMPETENCY VERIFICATION EV 5.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will conduct the Board of Directors report to the Stockholders under leadership of the Chairman of the Board of Directors.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
45		1. Guide student leaders in the conduct of report to the stockholders.	Read minutes of the first meeting, (election report) Present completed charter for approval of stockholders A. Company name B. Charter C. By-laws (locally developed)
		2. Spend some time clarifying understanding of any special local rules, by-laws, etc.	Present completed personnel organization chart with recommended appointments for approval
5	Chapter 6, "Selecting Products" and Chapter 7 "Designing and Engineering Products" from Manufacturing by Fales, et al.	3. Assign reading	Read

LESSON PLAN

5.D.1.2.3. Product Selection and Design
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 5 (NO.) LESSON: 4 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.3 (CODE NO.) COMPETENCY VERIFICATION EV 5.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify critera for selection of a product to be produced by the simulated company.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	 STUDENTS
30	Collect samples of mass produced products from other classes or schools to show to the class.	1. Lead class discussion in identifying criteria for selection of a product. Criteria identified should include: A. Product must fulfill a need of individuals or sub groups in society B. Product must be compatible with school/community resources with respect to: (1) Raw materials (2) Processes which can be conducted in the school laboratory (3) Skill levels of workers after brief training period (4) Legal and safe for the general community NO sling-shots, spears etc. (5) Space available for security, processing, and storage	Participate in discussion Take notes

LESSON PLAN (CONTINUED): 5 UNIT NO. 4 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
		(6) Rights of other producers, patents, etc. (7) Cost competitive with alternate products already on the market.	
20	Manufacturing by Fales, et al, pages 175-179	2. Assign students to review products suggested in text. (or any other place) and (by the following day) have two written suggestions for a product.	Review possible products and write out the name and source of two apparently acceptable ideas for a product

LESSON PLAN

5.D.4. Marketing Research
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 5 (NO.) LESSON: 5 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.3 (CODE NO.) COMPETENCY VERIFICATION EV 5.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to design document to gather market data in order to help select the product to be manufactured.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10	Manufacturing by Fales, et al. Pages 159-161	1. Ask company president to collect product ideas assigned to class members the previous day and to summarize or tally duplicate suggestions on the chalk board.	Collect suggestions Tally suggestions
10		2. Ask company president to conduct a discussion identifying the obvious reactions and features of the various suggestions, eliminating many by unamious consent.	Lead discussion
5		3. Ask company president to conduct a "straw vote" ranking of the top three product possibilities.	Rank the top three possibilities
20		4. Ask vice president in charge of marketing to direct a class discussion regarding ways to determine if a market exists for the product. This should lead to some form of market survey to be conducted by class members.	Lead discussion

LESSON PLAN (CONTINUED):

UNIT NO. 5

LESSON NO. 5

PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
		5. Assist students in the discussion of the design of a survey instrument that would provide some basis for comparision of the top 3 product suggestions.	Participate in discussion
5		6. Assign students to each design a survey instrument which could be mass copied for data gethering by class members, to be complete by the next day.	Design market survey documents measuring general reaction to the product. How often an individual would actually use it, what an individual might be willing to pay, and any other criteria the class has discussed.
		7. Assign reading in reference	Read assignment

LESSON PLAN

5.D.4. Marketing Research
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 5 (NO.) LESSON: 6 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.3 (CODE NO.) COMPETENCY VERIFICATION EV 5.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will select/modify the most feasible market evaluation instrument and use it to gather comparison data on the three products.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
40		1. Ask vice-president for marketing to collect suggested market survey documents from students and to take half of the class as a working committee to select and refine the best one for duplication and distribution to class members.	Lead committee Participate in committee task.
40		2. Ask vice president for production to utilize the remaining half of the class as a working committee to evaluate the three suggested products with relation to production. Problems considering A. Time to produce B. Cost of raw materials/ unit C. Skills needed D. Special set-up's. E. Number of separate operations F. Space requirements	Lead and participate in committee meetings

LESSON PLAN (CONTINUED): 5 UNIT NO. 6 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10		3. Xerox mass copies of the market survey and assign each student to gather data from a sample of potential customers (to be reported the next day)	Gather data

LESSON PLAN

5.D. Product Selection
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 5 (NO.) LESSON: 7 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.3 (CODE NO.) COMPETENCY VERIFICATION EV 5.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will make a logical decision regarding product selection based upon market data and preliminary production problem analysis

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
30		1. Ask the chairman of the Board to hold an "open" Board of Directors meeting to receive data from the market survey and the preliminary production analysis	Lead simulated Board of Directors meeting, Participate in meeting and/or observe Data analysis
5		2. Require Board of Directors to reach a decision regarding product selection	Make decisions
5		3. Ask the Board to decide on the maximum number of units to produce	
5		4. Ask chairman of the Board to assign the company president and treasurer as a committee of two to determine how much capital should be raised to finance the venture	
5		5. Assign students to read pages 159-171 in Manufacturing by Fales, et al.	Read

LESSON PLAN

5.E. Capital Formation
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 5 (NO.) LESSON: 8 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.4 (CODE NO.) COMPETENCY VERIFICATION EV 5.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify ways of raising Capital for an enterprise.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
20		1. Review ways in which a corporation can raise working capital. A. Selling common stock - buyers "own" part of the company but may loose their investment if the company fails. B. Selling "perferred stock" - these investors must be paid first in the event of company failure C. Loans/mortages if the company has "assets". D. Advance sales with pre-payment	Listen Take notes
5		2. Discuss the best or acceptable way for your class company to raise funds	Participate in discussion
5		3. Discuss the need for accurate record keeping (accounting)	
10		4. Ask the chairman of the Board to convene another "open" meeting to discuss/ recommend fund raising action by the company	Participate/observe board meeting

LESSON PLAN (CONTINUED):

5 UNIT NO.

8 LESSON NO.

PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10		5. Ask the chairman of the Board to convene a Stockholders meeting for the purpose of reporting to the stockholders seeking their approval of the company product and the proposed fund raising action (probably selling perferred stock to parents, or pre-payment on advance sales) NOTE: During an "open" Board meeting, only the Board members should actually particiate in discussion.	Participate in stockholders meeting
		6. Assign company officers to prepare fund raising documents for use by class members. For example stock certificates or advance sales contracts to be ready by the next class period.	Prepare documents

LESSON PLAN 5.E.F. Capital Formation and Accounting

(TOPICAL OUTLINE CODE NO. AND TITLE) PAGE 1 OF 2

UNIT: 5 (NO.) LESSON: 9 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.4;5.10 (CODE NO.) COMPETENCY VERIFICATION EV 5.2;5.5 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will understand the method of raising capital funds chosen by the class and participate in the procedure.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
15	Locally developed perferred stock certificates or advanced sales contracts	1. Ask company treasurer to distribute fund raising documents and explain to class members role expectations in the fund raising process. A. Each customer must be given a certificate, claim check, or other form of receipt B. Funds are to be submitted with a report IMMEDIATELY to the treasurer	Lead/direct the group Listen Ask questions
		C. Treasurer collects funds from each company agent (class members), gives them a receipt, records the transaction and deposits funds with the bank (could be school office or teacher)	Over a period of time, sell commitments, write receipts, keep records, prepare reports, deposit funds.
30		2. Review the basic elements of corporate accounting A. Accounts receivable (Funds coming in for various reasons)	Take notes Ask questions

LESSON PLAN (CONTINUED): 5 UNIT NO. 9 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
		B. Accounts payable (funds paid out for various reasons)	
		C. Purchasing procedures (1) Normal industrial procedure (2) Special procedures for the class company	Follow procedures as needed
		D. Invoicing procedures	
		E. Financial status reports	Treasurer will prepare status reports
5	EV instruments 5.1 and 5.2	3. Announce test for next day	Prepare for test

LESSON PLAN

5.A.F Introduction to Manufacturing and Corporate Structure
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 5 (NO.) LESSON: 10 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.1,2,3,4 (CODE NO.) COMPETENCY VERIFICATION EV 5.1;5.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to verify competencies related to corporate organization, role playing, capital formation and product selection.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
10	EV 5.1 and 5.2	1. Review competency areas which will be verified	Ask questions
30		2. Administer tests	Respond to test items
10		3. Review test questions and answers to clarify understanding	Ask questions

LESSON PLAN

5.G.1 Setting up for Production - Working Drawings
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 5 (NO.) LESSON: 11,12,13 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.5 (CODE NO.) COMPETENCY VERIFICATION 5.3 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to make, interpret or modify working drawings of the product.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5		1. Form the class into a Drafting and Design Department under the leadership of the Vice President for Research and Development.	Participate as a draftsman/ designer
15		2. Help the Vice President to assign drafting tasks according to the ability level of each student. Tasks will include: A. Working drawings and specifications of each and every part B. Assembly drawing C. Pictorial drawings or rendering of final product (utilize some artistic talent)	
130		3. Encourage students to communicate with each other in achieving standard sheet size and basic lettered information and resolving dimensional conflicts	Actually complete drawings as assigned

LESSON PLAN

5.G.3. Analysis of Production Operations
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 5 (NO.) LESSON: 14,15 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.6 (CODE NO.) COMPETENCY VERIFICATION EV 5.4 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to analyze the logical sequence of operations in order to make a product.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	_Manufacturing_ by Fales, et al, Pages 119 - 131 and page 199	1. Discuss the analysis of the operations to make and then assemble every part of a product.	Listen Take notes
5	Chalk board	2. Demonstrate how analysis of information is presented in a production flow chart	
5		3. Refer to flow chart on page 199 and ask questions clarifying student understanding of the operation and assembly sequence	
5		4. Explain purpose of operation direction sheet (page 200) and its relationship to the flow chart.	
30		5. Assign each student to prepare a flow chart with related operation direction sheet for the product chosen by the class for production	Analyze operations and begin preparation of a flow chart

LESSON PLAN (CONTINUED): 5 UNIT NO. 14, 15 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
30		6. Finish flow charts and operation directions	Finish flow chart
20		7. Ask the vice-president for production to inspect the various flow charts made by the students and adopt/modify the best one for class use.	Judge and select best flow chart

LESSON PLAN

5.G.3. Operational Analysis - Floor Plan
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 5 (NO.) LESSON: 16 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.6 (CODE NO.) COMPETENCY VERIFICATION EV 5.4 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to modify floor plan of facility to accomodate the flow of materials and sequence of operations needed to produce a product.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
	Floor plans of laboratory showing all FIXED equipment and work areas. (Locally developed)	1. Explain the purpose of a shop layout in mapping the path of material through the production sequences (page 131)	Listen Read layout plans
5		2. Explain how work pieces are temporarily stored and transported from station to station	
5		3. Lead the class in identifying job titles of workers for layout/flow chart on page 133.	
30		4. Distribute laboratory layout plan and assign each class member to draw a material flow/work station map for the product to be class produced.	Create material flow map
5		5. Ask vice president for production to select/modify or create the best layout for class use.	Judge/select/modify layouts

LESSON PLAN

5.G.4 Preparing Work Stations - Mass Production Concepts
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 5 (NO.) LESSON: 17 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.7 (CODE NO.) COMPETENCY VERIFICATION EV 5.4 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to explain the concepts of interchangeable parts, assembly line, material flow, division of labor, quality control, jigs, fixtures and special set-ups in relation to mass production.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
45	Manufacturing, by Fales et al, Chapter 11 and Chapters 1 and 2 Class developed production flow chart and laboratory layout on overhead transparency.	1. Using the class developed material flow chart and laboratory layout, review how the following concepts are being simulated - ask questions. A. How will interchangeable parts be developed and utilized? B. How will the assembly line be reflected? C. What major divisions of labor will be represented? Job titles? D. What is the function of quality control - how will it function in this company. E. What jigs, fixtures and special set-ups will be needed?	Respond to questions Record conclusions of this discussion for future development of jigs, fixtures or set-ups.

LESSON PLAN (CONTINUED):

UNIT NO. 5

LESSON NO. 17

PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
		F. How will individual work pieces be temporarily stored and transported?	
5		G. Assign readings in reference, Chapters 1, 2 and 11.	

LESSON PLAN

5.G.4.b,c Special Set-Ups and Jigs and Fixtures
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 5 (NO.) LESSON: 18 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.7 (CODE NO.) COMPETENCY VERIFICATION EV 5.4 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to create special set-ups, jigs and/or fixtures needed for the mass production exercise.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	Class developed production flow chart, operation directions and laboratory layout/ work station maps.	1. Ask the class to simulate a production set up operation under the direction of the vice-president for production	Lead class
40 (2-4)		2. Have the vice-president for production assign the students to various set-ups and or jigs and fixture creation. Provide close supervision for safe performance of needed operations. Students could work in small groups.	Perform one time operations needed to make set-ups or jigs and fixtures under supervision of teacher or lab assistant.
		3. Assign purchasing group to procure raw materials needed for set-up and production run.	Procure materials in an acceptable manner
		4. Assign marketing group to refine sales and distribution plan	Plan marketing strategy
5		5. Assign all vice presidents to prepare for a formal report at a Board of Directors meeting	Prepare reports

LESSON PLAN

5.H. Board of Directors Meeting
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 5 (NO.) LESSON: 19 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.1 (CODE NO.) COMPETENCY VERIFICATION EV 5.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will demonstrate the ability to plan and conduct a simulated meeting of a Board of Directors.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
45	Action Company Guide Page 79	1. Ask Chairman of the Board to lead a meeting of the Board following a pre-prepared agenda which would include: A. Call to order B. Reports from vice-presidents (1) Research and development (2) Production (3) Sales C. Financial report D. Old business E. New business F. Adjournment	Lead meeting Provide oral and visual reports Listen Ask questions Participate in discussion
5		2. Assign reading Chapter 10 in Manufacturing by Fales, et al.	Read

LESSON PLAN

5.G.4.c Training of Workers to Perform Manipulative Operations
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 3

UNIT: 5 (NO.) LESSON: 20 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.8 (CODE NO.) COMPETENCY VERIFICATION EV 5.5 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to perform the operations of measurement, layout, and cutting stock to dimension lengths using the radial arm saw.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
10	Hand out - Safety rules for use of Radial Arm saw (developed locally)	1. Review use of layout tools and procedures A. Measuring and marking B. Use of square C. Use of compass or dividers	Observe Ask questions Practice operations as needed/assigned in making jigs, fixtures and set-ups and in the production exercise which will follow
30		2. Safe operation of the radial arm saw as a cut off tool A. Body positions for right and left handed operators B. Safety classes C. On, off switch location D. Hand positions for right and left handed operators E. Material position against fence F. Use of stop blocks G. Controlling rate of cut	

LESSON PLAN (CONTINUED): 5 UNIT NO. 20 LESSON NO. PAGE 2 OF 3

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
		H. Return motor and blade to "normal" position I. Removal of small waste pieces J. Role of assistant to the operator K. Positive Safety Rules (1) Turn "on" saw only when you are ready to cut. (2) Turn "off" saw immediately when cut is finished (3) Hold work tight against the fence and the table (4) Be sure material holding hand is not in the path of the saw. Especially the THUMB (5) Be prepared to control the natural tendency for the saw to jump toward you into the work.	

LESSON PLAN (CONTINUED): 5 UNIT NO. 20 LESSON NO. PAGE 3 OF 3

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
		(6) Only cut approved materials (7) Let the saw stop by itself after turn off (8) ALWAYS keep hands away from the turning blade (9) Turn off power to change blades (10) DO NOT CHANGE FUNCTION FROM NORMAL "CUT OFF" OPERATION UNLESS APPROVED BY INSTRUCTOR	
10		3. Assign reading topies from Unit 5, Manufacturing by Fales et al. which will be needed in the production simulation. (starts on page 295.)	Read

LESSON PLAN

5.G.4.f. Training of Workers to Perform Manipulative Operations
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 5 (NO.) LESSON: 21 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.8 (CODE NO.) COMPETENCY VERIFICATION EV 5.5 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to dress one edge and face of stock on the jointer, and rip it to specified width on a table saw. NOTE: If these operations are not needed in the production exercise, substitute more relevant ones.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
5		1. Explain the main function of a jointer is to "true" one edge and/or face of a board	Listen
20	Hand out procedure and safety rules for use of jointer (locally developed)	2. Demonstrate safe operation of the jointer A. Check depth of cut B. Check minimum length of stock (locally determined) C. Use wooden hold down and push blocks D. Safety glasses E. Guard in place and functioning F. Control rate of feed by LISTENING to pitch of cutter head against work piece G. Turn off machine when finished H. Allow cutter head to stop naturally I. Special local rules	Listen Observe

LESSON PLAN (CONTINUED):

5
UNIT NO.

21
LESSON NO.

PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
		3. Allow selected students to operate jointer under close supervision and observation of the instructor and class	Operate jointer Observe
20	Hand out procedure and safety rules for operation of the table saw (locally developed)	4. Explain main function of a table saw as that of ripping stock to width	Listen
		5. Demonstrate safe operation of ripping on the table saw A. Set blade height B. Set rip fence C. Guard and splitter in place D. On-off switch location E. Use of push blocks F. Control feed rate by LISTENING G. Role of helper H. Removal of small objects I. Keeping hands away from blade J. Special local rules	
		6. Ask selected students to operate table saw under supervision of teacher, with class observation	Operate table saw to rip stock Observe
5		7. Announce test on safety rules and procedures associated with power machinery. Must be passed with 100% accuracy before approval is given to operate equipment independently	

LESSON PLAN

5.G.4.f. Training of Workers to Perform Manipulative Tasks
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 5 (NO.) LESSON: 22,23 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.8 (CODE NO.) COMPETENCY VERIFICATION EV 5.5 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to perform specialized manipulative tasks associated with the operation of the production company.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
100	Production flow chart and shop layout plan	1. Using the production flow chart and the shop layout plan, explain and demonstrate the various operations necessary to the production run so that each student will understand them	Observe Ask questions Practice under supervision when asked to do so
		2. Stress safety rules and procedures associated with each work station. Assign class members to develop safety rules for posting at each work station.	Create safety posters

LESSON PLAN 5.G.4.f. Training of Workers - Safety Tests

(TOPICAL OUTLINE CODE NO. AND TITLE) PAGE 1 OF 1

UNIT: 5 (NO.) LESSON: 24 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.8 (CODE NO.) COMPETENCY VERIFICATION EV 5.5 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will verify competency to operate laboratory equipment by passing safety tests with 100% accuracy.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10	Evaluation sheets 5.5	1. Review various pieces of equipment and operations which will be covered by the tests	Listen Ask questions
30		2. Administer tests EV 5.5 and those locally developed	Respond to test questions
10		3. Review test questions and clarify understanding	Ask questions

LESSON PLAN

5.I. Manufacturing Production Operation
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 5 (NO.) LESSON: 25 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.8 (CODE NO.) COMPETENCY VERIFICATION EV 5.5 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to simulate the "production run", resolving differences and problems.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10	Production flow chart and laboratory floor plan developed by the class Raw materials	1. Ask the vice president of personnel in cooperation with the vice president of production to assign students to work stations and job titles 2. Be sure quality control check points are covered 3. Be sure all raw materials are properly located	Assign students to tasks
40		4. Allow students to begin production run, provide help as needed. STOP RUN whenever a real problem develops.	Perform assigned tasks Solve problems

LESSON PLAN

5.I. Manufacturing Production Operation
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 5 (NO.) LESSON: 26 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.8 (CODE NO.) COMPETENCY VERIFICATION EV 5.5 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will evaluate their progress in the production run, resolve problems and continue run.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
10		1. Ask the vice president of production to lead the class in discussion of the problems of starting up the production, receive suggestions, make modifications necessary	Participate in meeting, Identify problems Make suggestions
40		2. Continue production run	Perform tasks

LESSON PLAN

5.J. Labor Unions - Purpose and Functions
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 5 (NO.) LESSON: 27 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.9 (CODE NO.) COMPETENCY VERIFICATION EV 5.4 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify the purpose and usual functions of a labor union.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
15		1. Explain how workers can organize into a bargaining unit whose officers represent the workers needs and concerns - a union	Listen Take notes
10		2. Describe the purpose of a union contract in setting working conditions, wage rates, fringe benefits, and settling grievences	
5		3. Describe the role of the federal government in protecting the rights of workers to organize under the National Labor Relations Act.	
5		4. Identify other functions of unions A. Collect dues/keep records B. Certify skills of workers C. Sponsor social fellowship events D. Cooperate in the training of apprentices	

LESSON PLAN (CONTINUED):

5
UNIT NO.

27
LESSON NO.

PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
		E. Political action and lobbying	
5		5. Identify the usual roles of officers of a local union A. Business agent or local president (conducts business) B. Secretary/Treasurer (keeps records) C. Steward (an in-plant worker who receives information from fellow members and may carry "grievences" to company management for resolution	
5		6. Announce that the class workers will hold an organizing meeting on the following day	

LESSON PLAN 5.J.4. Labor Union Organization and Operation
(TOPICAL OUTLINE CODE NO. AND TITLE) PAGE 1 OF 2

UNIT: 5 (NO.) LESSON: 28 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.9 (CODE NO.) COMPETENCY VERIFICATION EV 5.4 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will simulate the operation of a labor union.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
50	3 x 5 cards with the question: Do you wish to be represented by a bargaining unit? Yes ___ or No ___ Signed ______________ (Locally developed)	1. Ask one of the student workers (not a member of the management team) to distribute cards on which workers can express their interest in formation of a bargaining unit.	Distribute interest cards
		2. Ask worker to tally the responses and announce the result	Tally responses
		3. If there is not a majority in favor of the union, discuss the rights of individual workers to refuse formal representation	
		4. If there is a majority ask the worker to conduct an organization meeting electing a A. Business agent B. Secretary/Treasurer C. Union Steward	

LESSON PLAN (CONTINUED):

UNIT NO. 5

LESSON NO. 28

PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
		5. Following the election ask the business agent to lead the local in determing the name of the union and the amount of dues	Lead discussion
		6. Union Secretary/Treasurer should collect and record dues from all members wishing to join	Keep records
		7. Assign union officers and company Board of Directors to prepare for negotiations on the following day.	

LESSON PLAN

5.J.4 Labor Union Operation - Negotiations
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 5 (NO.) LESSON: 29 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.9 (CODE NO.) COMPETENCY VERIFICATION EV 5.4 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will simulate the negotiation of a union - management contract.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
30		1. While the rest of the class observes quietly, ask the company and union officers to negotiate the basic elements of a contract. Among other clauses they may agree upon should be these basic ones. A. Beginning and ending dates of contract or the contract period B. Rate of wages for work performed (or other compensation, paper play money if available and no other alternative exists) C. Work quality statement, (workers will exhibit good craftsmanship) D. Union officials can represent workers in individual grievences cases.	Participate Observe Ask questions

LESSON PLAN (CONTINUED): 5 UNIT NO. 29 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10	Blank ballots for indication of approval	2. Ask union business agent to present contract terms to the union membership for approval	Listen Evaluate
10		3. Ask union business agent to announce the approval vote	Vote

LESSON PLAN

5.I. Manufacturing Production Run (Continued)
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 5 (NO.) LESSON: 30,31 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.8 (CODE NO.) COMPETENCY VERIFICATION EV 5.5 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will continue physical production of the product, simulating management and labor roles.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
15	Personnel organization chart Production flow chart	1. Ask management officals to continue the production run simulating the roles of workers, supervisors, etc. 2. Ask a worker to generate a "grievence"	
15		3. Stop production and assign union and company officals to resolve the problem	
65		4. Continue production	
5		5. Assign union officers to plan a social event (see lesson 36)	Plan social function

LESSON PLAN

5.K. Marketing the Product
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 5 (NO.) LESSON: 32 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.10 (CODE NO.) COMPETENCY VERIFICATION EV 5.5 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify the behaviors of a successful direct sales person.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	 STUDENTS
15	Order blanks/delivery tickets Sales report summaries (locally obtained) Action Company Guide, Pages 85, 86 and 87.	1. Describe the procedure widely accepted for direct sales A. Attract attention and begin communication B. Stimulate interest in the product and create desire for ownership C. ASK for a purchase! D. Close the sale (1) Agree upon delivery arrangements (2) Accept money or checks (3) Fill out receipt/ delivery ticket E. Thank customer F. Ask for referral	
25		2. Ask two students to role play the salesperson/ customer role as the class observes.	Role play or observe
10		3. Ask the vice president of sales to provide directions to the class members regarding product sales and reporting procedures.	

LESSON PLAN (CONTINUED):

UNIT NO. 5

LESSON NO. 32

PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
		4. Assign students to report sales the next day	

LESSON PLAN

5.K. Marketing the Product - Sales Reports
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 5 (NO.) LESSON: 33 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.10 (CODE NO.) COMPETENCY VERIFICATION EV 5.6 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will report sales, discuss successes and failures.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
50		1. Ask vice president of sales to collect sales reports and funds from salespersons	Lead meeting Report sales
		2. Have vice president summarize total sales on chalkboard	
		3. Assign treasurer to maintain financial records and up-date accounts receivable report	Keep records
		4. Discuss successes and failures	Participate in discussion
		5. Assign president to prepare agenda for corporate executive meeting to receive reports and analyze condition of the company	

LESSON PLAN

5.L.3. Corporate meeting for Reporting, Accounting and Profit/Loss Analysis
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 5 (NO.) LESSON: 34 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.2 (CODE NO.) COMPETENCY VERIFICATION EV 5.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will participate in the analysis of accounting reports to determine profit and loss.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
40	Chapter 12, Manufacturing by Fales, et al. "Action Company Financial Report", Appendix, Action Company Guide.	1. Ask chairman of the Board to convene a meeting of the officers to hear reports and analyze the condition of the company. A. Production report B. Sales report C. Treasurer (1) Accounts payable (2) Accounts receivable (3) Cash and assets on hand (4) Financial status of company 2. Be sure accounts payable are paid!	Lead meeting Participate Observe
10		3. President leads a summarizing discussion of the production-sales effort and condition of the company. A. What went right? B. What went wrong? C. What could be better? D. What was learned?	

LESSON PLAN

5.L. Liquidation of a Company
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 5 (NO.) LESSON: 35 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.11 (CODE NO.) COMPETENCY VERIFICATION EV 5.4 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify ways in which a company is terminated.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
20	Action Company Guide, Page 88	1. Explain the ways in which a company may go out of business. A. Normal liquidation (1) Assets converted to cash by sale of jigs, fixtures, unsold product, etc. by auction. (2) Pay off of all obligations (3) Preparation of final financial statement (4) Division of cash to stockholders with liquidation report	
5		B. Purchase of company with assets and liabilities by another company	
20		C. Bankruptcy (1) Court seizes control of company assets (2) Court receives claims against the corporation	

LESSON PLAN (CONTINUED):

UNIT NO. 5

LESSON NO. 35

PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
		(3) Court sells assets at auction (4) Court pays each claimant a portion of the funds due them (5) Court declares the company out of business	
5		2. Assign company Board of Directiors to plan a logical procedure for liquidation of simulated company	Plan liquidation process and documents

LESSON PLAN

5.L. Company Liquidation
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 5 (NO.) LESSON: 36 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.11 (CODE NO.) COMPETENCY VERIFICATION EV 5.4 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will liquidate their company in a logical manner

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	Action Company Guide Page 88	1. Ask chairman of the Board to convene a meeting of the Board of Directors to present plans for liquidation	
45		2. Guide students through their plan, accounting and disposing of assets, settling liabilities and creating a final statement to stockholders	

LESSON PLAN

5. Competency Verification
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 5 (NO.) LESSON: 37 (NO.) UNIT PERFORMANCE OBJECTIVE: 5.6;5.7;5.9 (CODE NO.) COMPETENCY VERIFICATION EV 5.4 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to verify cognitive competencies related to manufacturing

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10	EV. Sheets 5.4	1. Review competencies which will be verified	Ask questions
30		2. Administer tests	Respond to test items
10		3. Review test questions	Ask questions

(EV. 5.1)
(UPO. 5.1)

EMPLOYEE RATING SCALE

STUDENT: ____________________ CLASS: ________ DATE: ________

The following information will be chared only by the teacher and the student. The information will be most helpful in grading the student.

ITEM	SELF RATING	TEACHER RATING
ATTENDANCE Attends regularly Punctuality		
PRODUCTION Quantity of work Quality of work Remains on job Planning Judgment		
ATTITUDE Towards job Towards other employees Towards supervisors		
CUSTOMER RELATIONS (IF APPLICABLE) Outgoing, friendly Suggests sales Courtesy		
CHARACTER Initiative Dependability Integrity Cooperation Calmness under pressure Self-confidence		
PERSONAL APPEARANCE Appropriate attire Neatness		
LEADERSHIP QUALITIES		
MISCELLANEOUS Housekeeping Safety conscious		

RATINGS:
Excellent - 5 points
Above average - 4 points
Average - 3 points
Below average - 2 points
Poor - 1 point

(EV 5.2)

NAME: ______________________________ DATE: ____________

UPO 5.2

INSTRUCTIONS:

Answer the following statements using a true or false answer.

_____ 1. One goal of a manufacturing company is to make a profit.

_____ 2. A manufacturing company must be a large organization.

_____ 3. One advantage that a partnership has over a proprietorship is that in a partnership there is more than one person to make decisions and share responsibilities.

_____ 4. In a corporation, one person, the president, owns the company.

_____ 5. Articles of incorporation are prepared for every company regardless of the type of ownership.

INSTRUCTIONS:

Select the correct letter that mostly completes the statement.

_____ 1. Profit is

A. Money spent by the company to pay expenses.
B. Money that a company receives from selling stock.
C. All money received from selling products
D. Money left after paying expenses

_____ 2. In a profrietorship, the company is owned and run by

A. A group of company leaders
B. One person
C. The stockholders
D. The partners

_____ 3. A company that declares bankruptcy

A. Has more debts than assets
B. Has more assets than debts
C. Is making a profit
D. Has plenty of money available to pay its bills

_____ 4. Overall policy decisions are made by the

A. R & D department
B. Board of Directors
C. Marketing department
D. Personnel department

_____ 5. The marketing department is in charge of

A. Selling products
B. Setting up an efficient production system
C. Hiring new workers
D. Producing products

INSTRUCTIONS:

Respond to items below by placing the letter of the best definition in front of the word in the first column

_____ 1. Inputs
_____ 2. Outputs
_____ 3. Partnership
_____ 4. Corporation
_____ 5. Production department
_____ 6. Stock
_____ 7. Board of Directors

A. A company owned by stockholders
B. A company owned by one person
C. A company owned by two or more people
D. People, money, machines, and materials
E. Designs new products
F. Money that is owed
G. Shares of ownership in a company
H. Produces products
I. Sets company policy and determines company goals
J. Products

INSTRUCTIONS:

Answer the following essay questions using complete sentences.

UPO 5.3

1. Identify at least three (3) of the factors which are considered in the process of selecting a product to be manufactured.

UPO 5.4

2. Identify at least two (2) ways of accumulating capitol for corporate operation.

(EV 5.3)

NAME: ______________________ DATE: _______________ SCORE: ___

PRODUCT DRAWING EVALUATION

ITEMS EVALUATED	POINTS	EVALUATION
Neatness	10	
Accuracy	10	
Proper use of projection principles	10	
Proper use of alphabet of lines	10	
Lettering	10	

ROLE PERFORMANCE

ITEMS EVALUATED	POINTS	EVALUATION
Quantity of work	10	
Quality of work	10	
Job knowledge	10	
On task	10	
Follows general laboratory safety rules	10	
TOTAL	100	

(EV 5.4)

NAME: ____________________ DATE: ____________________ SCORE: ______

UPO ____

INSTRUCTIONS:

Using a separate sheet of paper, answer the following questions.

1. List a logical sequence of operations needed to produce a wooden wall plaque.
2. Describe, using complete sentences, the contributions of the following concepts to mass production operations.
   - A. Interchangable parts
   - B. The assembly line
   - C. Material and product flow
   - D. The division of labor
   - E. Jigs and fixtures
   - F. Quality control
3. Labor unions are often associated with the production enterprise, identify the normal functions of this type of labor union.
4. Corporations can be terminated in many ways. Describe one way in which a corporation can be voluntarily terminated.

(EV 5.5)

QUALITY CONTROL CHECK SHEET

DIRECTIONS:

Mark one column for each product you inspect. ✓ Make a check if the process has been done correctly. ○ Make a circle if the process has NOT been done correctly In the bottom square, summarize the total product.

PRODUCT	EXAMPLE	1	2	3	4	5	6	7	8	9	10	11	12
PART FABRICATION													
1. All parts are correct length	✓												
2. All parts are correct width	✓												
3. All parts are correct shape	○												
4. Holes are in correct location, size	✓												
5. Bends are in correct location, angle	○												
ASSEMBLY (IF PRODUCT HAS MORE THAN ONE PART)													
6. Joints fit correctly	✓												
7. Movable parts work correctly	✓												
8. Proper amount of glue, cement, or solder	✓												
9. Riveting done correctly	NA												
10. Nails or screws acceptable	NA												
FINISH (IF USED)													
11. Sanding acceptable	✓												
12. Grinding acceptable	NA												
13. Polishing acceptable	NA												
14. Finish acceptable	✓												
TOTAL PRODUCT													

A - Accept

C - Correct

R - Reject

(EV 5.6)

NAME: ______________________ DATE: __________________

SALE REPORT

DATE	PRODUCT NAME	NO. CHECKED OUT	NO. SOLD	NO. RETURNED

No. of products requiring delivery ________

Locations that items are delivered to: ______________________

____

____

No. of items that require pick-up ________

Pick-up arrangements made by: ____________________________

INSTRUCTIONAL PLAN

UNIT SIX

6	Construction	6 weeks total
	A. Introduction	1 day
	1. Definition of construction	
	2. Overall plan for simulation of construction companies	
	3. Value of role playing	
	4. General safety	
	B. Types of construction	1 day
	1. Buildings	
	2. Dams	
	3. Roads	
	4. Bridges	
	5. Mines, tunnels	
	6. Ships	
	C. Construction plans and drawings	2 days
	1. Archectural blue prints	
	a. Plan views	
	b. Elevations	
	c. Structural details	
	2. Engineering drawings	
	3. Topographical maps	
	4. Ship descriptions	
	5. Common scales	
	D. Major construction roles	1 day
	1. Client - customer - has need and funds to fulfill need	
	2. Architect - Hired by customer	
	a. Prepares plans and specifications, fulfill customer's need	
	b. Is responsible for safety of structural design	
	c. May oversee or inspect the work in progress to be sure that specifications are followed	
	3. General contractor - hired by customer	
	a. Builds structure according to specifications	
	b. Is responsible for safety of workman, surrounding environment	
	c. Schedules, inspects, and approves work of subcontractors	

6 Construction (Cont.)

4. Sub-contractors
    a. Complete small units or divisions of the total job
    b. Responsible for safety of workers employed by him
    c. Responsible for quality of worker's performance
5. Tradesmen
    a. Performed skilled operations necessary for building the structure
    b. Responsible for personal safety
    c. Responsible to protect fellow workers, regardless of employer, from careless or negligent personal action
6. Equipment operators
    a. Perform various operations with powered equipment
    b. May or may not be considered tradesman
    c. Responsible for safety of machine use to self and others
7. Laborers
    a. Performs unskilled tasks such as moving material by hand or with hand tools
    b. Responsible for personal safety and protection of fellow workers from negligent acts

E. Common structure of buildings — 8 days
1. Site preparation
2. Footers and foundations
3. Masonary walls
4. Wood floor decks
    a. Sills and anchors
    b. Floor joist
    c. Bridgeing
    d. Support beams
    e. Sub-floor
5. Wood frame walls
    a. Shoe or base plate
    b. Wall studs
    c. Wall sheathing
    d. Top and double plates

    e. Corner post construction
    f. Partition post construction
    g. Windows and doors
    h. Cripples, nailers

6. Wood frame roofs
    - a. Common rafter system
    - b. Trusses
    - c. Ceiling joist
    - d. Roof sheathing
    - e. Shingles or other covering
7. Plumbing - mechanical equipment
    - a. Storm sewer system
        - (1) Roof
        - (2) Gutters, downspouts
        - (3) Footer drain tile
        - (4) Lot drainage and landscapeing
    - b. Sanitary sewage system
        - (1) Drains
        - (2) Traps
        - (3) Vents
        - (4) Soil pipe
        - (5) Septic tank operation
        - (6) Distribution box
        - (7) Field lines
        - (8) Inspections during construction
    - c. Potable water supply
        - (1) Meter
        - (2) Cold water system
        - (3) Hot water system
        - (4) Faucets and valves
        - (5) Piping materials and processes
    - d. Heating and air conditioning
8. Electrical system installation (optional)
    - a. Service drop
    - b. Distribution box
    - c. 110 volt branch circuits
    - d. 220 volt branch circuits
    - e. Low voltage circuits - door bell
    - f. Inspections
9. Insulation
    - a. Floors
    - b. Walls
    - c. Ceilings

6 Construction (Cont.)

10. Finishing the structure
 a. Wall-ceiling covering-interior
  (1) Plaster
  (2) Dry wall
  (3) Paneling
  (4) Paint
 b. Wall covering - exterior
  (1) Masonary veneer
  (2) Paneling
  (3) Clap-boards
  (4) Paint
 c. Floors
  (1) Tile
  (2) Carpet
  (3) Lineoleum
  (4) Hardwood
 d. Finishing carpentry
  (1) Base boards - mouldings
  (2) Window-door casings
  (3) Cabinet installation
  (4) Built-ins
  (5) Hanging doors

F. Simulation of construction roles 9 days
 1. Planning a structure
  a. Designed functions
  b. Structural engineering
  c. Problem solving
  d. Drawing plans
  e. Writing specifications
 2. Estimating construction costs
  a. Material costs
  b. Labor and service costs
   (1) Work rates
   (2) Costs/unit
   (3) Permits, inspections
   (4) Delivery charges
   (5) Rental of equipment
  c. Insurance
  d. Overhead - utilities, office expense
  e. Architectural fees
  f. Profit
   (1) General contractor
   (2) Sub-contractor

6 Construction (Cont.)

3. Preparing bids and contracts formation
    a. Normal clauses
        (1) Description of the work to be performed
        (2) Amount of pay
        (3) Specifications to be followed or referral to plans
        (4) Time deadline with possible penalities
        (5) Acceptable workmanship standards
    b. Parties to contracts
        (1) Client and architect
        (2) Client and general contractor
        (3) General contractor and subcontractor
        (4) Contractors and labor unions
4. Performing construction tasks (Building a tool shed)
    a. Interpreting plans
    b. Measurement and layout operations
        (1) Sills
        (2) Floor joist placement
        (3) Shoes, plates
        (4) Stud placement
        (5) Rafters
        (6) Wall, floor and roof sheathing
        (7) Faceing and casings
    c. Cutting operations
        (1) Lengths - radial arm saw
        (2) Plywood - portable electric saw
        (3) Roofing materials
        (4) Safety
    d. Assembly operations
        (1) Placing and holding framing members
        (2) Driving nails
        (3) Installing siding and roofing
        (4) Installing doors and windows
        (5) Painting

6 Construction (Cont.)

- e. Installing electrical service
  - (1) Identification of components
    - (a) Feed line
    - (b) Convenience outlet
    - (c) Switch
    - (d) Light fixture
  - (2) Location of components
  - (3) Installation of components
    - (a) Drill holes
    - (b) Installation screws and nails
    - (c) Electrical connections
    - (d) Inspection
    - (e) Safety
- f. Analysis of actual costs
  - (1) Materials including waste
  - (2) Labor
  - (3) Supervision
  - (4) Utilities
  - (5) Tool and equipment maintenance
- g. Determination of profit

G. Careers in construction — 1 day

- 1. Masonary
  - a. Helper
  - b. Laborer
  - c. Concrete mixer operator
  - d. Brick and block layer
  - e. Concrete finisher
- 2. Carpentry
  - a. Form builder
  - b. Framer
  - c. Roofer
  - d. Siding mechanics
  - e. Cabinet maker
  - f. Finish carpenter
  - g. Helper
- 3. Electricity
  - a. Electrician
  - b. Helper
  - c. Linesman
  - d. Equipment operator
  - e. Inspector
  - f. Engineer
  - g. Technician

6 Construction (Cont.)

4. Heating - air conditioning
   a. Installer
   b. Service-repairman
   c. Helper
   d. Insulation installer
   e. Systems designer
5. Plumbing
   a. Equipment operator
   b. Laborer
   c. Plumber
   d. Helper
6. Site preparation
   a. Equipment operators
   b. Surveyor
   c. Rod person
   d. Field engineer
   e. Laborer
   f. Landscaper
7. Commercial construction trades
   a. Steel fabricator
   b. Welder
   c. Iron riggers
   d. Equipment operators
   e. Glazer

UNIT PERFORMANCE OBJECTIVES

UNIT SIX

UNIT PERFORMANCE OBJECTIVES		EVAL INSTRUMENT CODE
UNIT 6	Construction	
6.1	Students will be able to define construction, distinguish the field from manufacturing and identify 4 different kinds of structures that are constructed on a written test.	EV 6.1
6.2	Students will be able to answer questions regarding the point of view and basic content of each of the following parts of structural drawings: plans, elevations, sections and details, specifications. Contour and topographical maps with 80% accuracy.	EV 6.1
6.3	Students will be able to interpret scaled distances from structural drawings given a ruler or scale under usual testing conditions with 90% accuracy.	EV 6.2
6.4	Students will be able to match the usual responsibilities of each of the following with a description of their roles in construction: client/customer, architect, general contractors, skilled tradespeople, equipment operators, laborers, with 90% accuracy on a written test.	EV 6.3
6.5	Students will be able to recognize/define/interpret the words commonly used in conversation and writing regarding construction to identify structural components and members, systems and subsystems, and/or functions with 70% accuracy on an objective test.	EV 6.4
6.6	Students will be able to describe the operation of a home sanitary sewer-septic system including the functions of vents, traps, septic tanks, distribution box and field lines. Achievement will be demonstrated by a written research paper describing the functions: understanding vocabulary terms will be included in EV 6.4.	EV 6.4 6.5

UNIT PERFORMANCE OBJECTIVES

UNIT 6 Construction (Cont.)

6.7	Given a set of working drawings and specifications for a small tool shed, students will be able to answer questions regarding the over-all size of the building, the size of the access door, the maximum amount of interior head room, the materials used for floors, walls, roof and the location of electrical switches and lights with 80% accuracy.	EV 6.6
6.8	Given the plans and specifications for a small building the students will be able to estimate amounts of raw materials needed to build it, find, retain sources of supply in the local market area, and estimate the costs of the raw materials. Achievement will be demonstrated by successful completion of an assignment sheet acceptable to the instructor.	EV 6.7
6.9	Students will be able to describe the purpose of construction contracts, identify the most common clauses, and answer questions requiring the interpretation of a contract which they are given to read.	Ev 6.8
6.10	Under direct supervision of an instructor and with the assistance of fellow students, students will be able to safely perform the elementary construction operations of measuring and layout, sawing with a hand saw and/or portable electric saw, drilling or boring by hand or portable electric drill, structural placement, holding and fastening using nails. Competency will be verified by a check-off sheet identifying those operations actually performed at least once by the student during construction of the group project.	EV 6.9
6.11	Students will be able to describe the training and working conditions of construction workers in a written report.	EV 6.10

LESSON PLAN

6.A. Introduction to the Construction Unit
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 6 (NO.) LESSON: 1 (NO.) UNIT PERFORMANCE OBJECTIVE: 6.1 (CODE NO.) COMPETENCY VERIFICATION EV 6.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to explain the difference between construction technology and manufacturing technology and be motivated to learn about the field through role playing.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
5	Filmstrip 1. Exploring the Construction Industry, McKnight (Optional)	1. Define construction technology as those techniques utilized to construct a structure on a building site in a systematic and efficient manner.	Listen Take notes or view filmstrip
5		2. Explain that construction differs from manufacturing usually in the size of the projects, the permanent placement of the product in the earth (except for mobile units and ships) and personnel organization and responsibilities of the general contractor - subcontractor system.	
20	Handout or black board sketch of Figs 1-21, page 15 of the text	3. Explain the four parts of construction technology using an illustration A. Processes (1) Excavation (2) Framing (3) Pre cast (4) Plumbing (5) Etc.	

LESSON PLAN (CONTINUED):

6 UNIT NO.

1 LESSON NO.

PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
		B. Materials (1) Concrete (2) Wood (3) Metal (4) Ceramics (glass, tile) (5) Finishes (paint) C. Personnel (1) Hiring (2) Training (3) Establishing working conditions (4) Advancing (5) Retiring D. Management (1) Scheduling (2) Estimating (3) Contracting (4) Writing specifications (5) Designs (6) Codes	
5		4. Provide an overview of role playing in the construction industry which will be followed by the class. The formation of a construction company.	
5		5. Assign students to read chapter 1, in Construction by Landers.	Read assignment

LESSON PLAN

6.B. Types of Construction
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 6 (NO.) LESSON: 2 (NO.) UNIT PERFORMANCE OBJECTIVE: 6.1 (CODE NO.) COMPETENCY VERIFICATION EV 6.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify the major characteristics and processes employed in various types of construction.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
30	Chalk board	1. Ask the class to identify different types of construction projects and to further describe how they differ or, identify relatively unique processes associated with each one. Record and summarize on the chalk board. Types identified should include: A. Buildings B. Dams C. Roads D. Bridges E. Mines F. Tunnels G. Ships	Participate in disucssion Take notes from chalk board
10	Samples of technical drawings from various construction projects in the local area. (Teacher obtained)	2. Show students part of plans from locally constructed projects. Projects differ in respect to: A. General purpose of structure B. Skills of workers C. Hazards to workers D. Types of specialized mechanical equipment	View plans Note similarities and differences.

LESSON PLAN (CONTINUED): 6 UNIT NO. 2 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
		E. Raw and finished materials F. Specialized drawings, specifications, and plans.	
10	Construction, by Landers. Chapter lo	3. Assign students to read Chapter 10, pages 70 - 80 in Construction by Landers. (Assignment sets the stage for the next lesson)	Read

LESSON PLAN

6.C.1 Construction Plans and Drawings
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 6 (NO.) LESSON: 3 (NO.) UNIT PERFORMANCE OBJECTIVE: 6.2 (CODE NO.) COMPETENCY VERIFICATION ______ (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify the point of view and purpose of structural plans, elevations, detailed sections and interpret architectural symbols.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
20	World of Construction "Dream house" model with associated architectural drawings (locally obtained)	1. Using the dream house as a model, define the point of view, symbols used and purpose of each of the following architectural drawings. A. Floor plan B. Elevations C. Typical wall section D. Foundation plan E. Electrical plan	Listen Take notes
30	Assignment sheet (locally produced)	2. Distribute assignment sheets which require students to read and interpret the "Dream House" plans in order to answer the questions. Questions should proceed from general and easy to more specific and complex. For example: 1. How many bed rooms are there? ..... 12. What is the height of the front door?	Respond to questions on assignment sheet by reading and interpreting archetectural plans.

LESSON PLAN

6.C.3. Topographical Maps and Site Plans, Drawing Scales.
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 6 (NO.) LESSON: 4 (NO.) UNIT PERFORMANCE OBJECTIVE: 6.2;6.3 (CODE NO.) COMPETENCY VERIFICATION EV. 6.1;6.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to recreate the terrain of the building site as described by a contour site plan. They will further be able to draw a scaled profile line across a building site.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
	Sand box 3' or 4' square for use as a model building site. 4' straight edge and ruler	1. Dampen sand in box so that it will hold its shape ahead of class	
5	*Construction Laboratory Manual*, Landers, Page 13	2. Explain the purpose and interpretation of contour mapping.	Listen
5	*Exploring the Construction Industry*, Page 47 by Betts, Fannin and Hauenstein.	3. Pass out copies of the contour map on Page 13, and lead group in arriving at a general conception of the shape of the land	Participate in discussion
5		4. Crudely re-shape the surface of the sand to become a scaled model of the land surface on the contour map.	Observe Offer suggestions
25		5. Assign students to draw cross grid lines on the map at a convenient scale and then to much more accurately shape the surface of the sand to conform to the map.	

LESSON PLAN (CONTINUED): 6 UNIT NO. 4 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
		6. Demonstrate how to use the straight edge across the top of the sand box for survey cross lines and the ruler to check the elevation of each cross grid point.	Observe
		7. Supervise students as they complete assignment	Model sand surface to scale
10		8. Assign students to draw the profile line indicated on the contour map.	Draw a profile line from data given.

LESSON PLAN

6.D. Major Construction Roles
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 6 (NO.) LESSON: 5 (NO.) UNIT PERFORMANCE OBJECTIVE: 6.4 (CODE NO.) COMPETENCY VERIFICATION EV 6.3 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify the usual responsibilities associated with construction industry roles such as client, architect, general contractor, etc.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
	See detailed unit topic outline for major responsibilities of construction industry roles.	1. Explain the roles of various parties related to a construction project and their inter-relationship to each other. A. Client B. Architect C. General contractor D. Sub-contractor E. Tradesmen F. Equipment operators G. Laborers	Listen Take notes
		2. Assign students to research the kind of preparation and training each of the individuals listed above must undergo to be qualified for their occupation	Complete research assignment

LESSON PLAN

6.E.1-6. Common Structure of Buildings
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 6 (NO.) LESSON: 6 (NO.) UNIT PERFORMANCE OBJECTIVE: 6.5 (CODE NO.) COMPETENCY VERIFICATION EV 6.4 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to recognize vocabulary terms used in construction and explain the function of common structural parts of building.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
15	Dream house model or other model of wood frame building locally obtained.	1. Using the dream house as a model (or other model,) and the chalk board for summarization, identify the various sub systems of a structure, naming the parts and explaining their functions. See detailed content outline for a list of the systems and sub parts to be discussed.	Observe model Take notes
25	4 x 6 blank flashcards for quantity class distribution	2. Assign groups of students to prepare 10 "flashcards" for quizzing and review. The front of each card will contain a building vocabulary term, its definition will be recorded on the back of the card.	Prepare flashcards by identifying building structure, vocabulary terms and defining them.
10		3. Allow one group of students to quiz another on their words - then swap roles.	Review terms by group quizzing.

LESSON PLAN

6.E.1 Site Preparation

(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 6 (NO.) LESSON: 7,8 (NO.) UNIT PERFORMANCE OBJECTIVE: 6.11 (CODE NO.) COMPETENCY VERIFICATION EV 6.10 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Working in groups, students will be able to stake out a building for excavation utilizing an optical level, stakes, batter boards, string, and common carpenter tools.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	 STUDENTS
10	Foundation plan for small cottage, tool shop, etc. Optical level, carpentry tools-measuring tape, hammer, nails, hand saw, heavy hammer, claw hammer. Boards and stakes. Construction by Landers, Page 269.	1. Using Fig 38-14 as a guide, explain how batter boards and string are used to outline a building excavation. A. Excavation lines must be at least 2 ft. from building foundation lines. B. Batter boards and stakes must be at least 4 ft. from building to avoid caving in. C. Same batter boards and string is used to guide main excavation, footer excavation, and then foundation block work by simply moving the strings. D. Top of batter boards must all be in the same plane.	Take notes

LESSON PLAN (CONTINUED): 6 UNIT NO. 7,8 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10	Move to outside clear area with relatively soft ground.	2. Demonstrate how to use the optical level to establish a reference plane for leveling batter boards. A. Level instrument B. Focus instrument for distance C. Measure down from optical plane to same amount for each point to be leveled.	Observe procedure
5		3. Lead class in "reading" foundation plan to determine size of excavation needed.	Participate in reading plan and making decisions
25		4. Assign class to work in two groups laying out the excavation.	Locate stakes Drive stakes Locate batter boards Fasten batter boards
50		5. Explain how to square the building using 6 8 10 triangulation 6. Demonstrate how to check for squareness and make corrections	Locate strings Fasten strings Check for squareness

LESSON PLAN

6.E. Wood Frame Support Systems
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 6 (NO.) LESSON: 9,10 (NO.) UNIT PERFORMANCE OBJECTIVE: 6.5 (CODE NO.) COMPETENCY VERIFICATION EV 6.4 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify the names of framing members and explain the major loading forces within them in a structure.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
15	Typical wall section - transparency (teacher obatined) model home showing framing details (teacher obtained)	1. Show the typical wall section and structural model. Discuss the names, functions, and forces associated with: A. Center beams B. Floor joist C. Wall studs D. Plates E. Bridging F. Headers	Listen Observe Takes notes
10		2. Explain the forces involved in the common rafter system used for small buildings A. Rafter - linear compression down toward the plane, outward pressure on the plate and wall and bending in the center of the rafter B. Collar tie - ceiling joist has overall tension holding the walls from spreading and bending in the middle.	Listen Take notes

LESSON PLAN (CONTINUED):

UNIT NO. 6

LESSON NO. 9,10

PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES: TEACHER	STUDENTS
5		3. Explain the structure of the common "W" truss	
35	Balsa wood sticks and model airplane glue.	4. Divide the class into small groups and assign each group to build in model form a pair of common rafters with base ceiling joist ties and a pair of "W" trusses built to the same scale.	Build model rafter and truss systems.
30	Pail for bricks for loading, hanging wire.	5. In a contest environment, supervise students in testing each group's structures to the breaking point. Note where and why the structure failed.	Test structures Observe results Draw conclusions
5		6. Explain to class that many sagging roofs and collasped buildings result from people not knowing any better than to cut structural members which get in their way.	

LESSON PLAN

6.E.7 Plumbing in Buildings and Homes
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 6 (NO.) LESSON: 11,12 (NO.) UNIT PERFORMANCE OBJECTIVE: 6.6 (CODE NO.) COMPETENCY VERIFICATION EV 6.4;6.5 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify the three major water control systems associated with buildings and further identify the functions of sub-parts of the system.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	Chalk board or teacher designed information sheet. For reference and answers to specific questions, Plumbing, Installation and Design L.V. Ripka, Chicago; American Technical Society, 1978. Good diagram, on page 285 of Exploring the Construction Industry by Betts, Fannin, and Hauenstein.	1. Name and describe the general function of each of the three major water control systems associated with buildings A. Storm sewer - control of rain water B. Potable water supply - control of drinking, cooking and washing water. C. Sanitary sewer - control of waster liquids and solids from the home	Listen Take notes
5	Old Sears and Roebuck (or other general) catalogs or old construction related magazines. Paste or scotch tape. Three large cardboard or poster sheets, approx. 3 x 4 ft.	2. Divide the class into three research groups, one for each system, and assign the groups to prepare illustrated posters showing the names of various parts of their assigned plumbing systems, a picture of the part (for example a sanitary trap) and a brief description of the function of the part in the overall system.	Prepare information posters by searching for pictures, organizing the information, pasting pictures appropriately and preparing statements of functions of parts.

LESSON PLAN (CONTINUED): 6 UNIT NO. 11,12 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
40		3. Provide direction and assistance to student groups as needed.	
40		4. When posters are complete, display them and ask a student from each group to provide an oral summary of the system and its function. Fill in gaps in information provided.	View posters Give oral reports Listen Ask questions
10		5. Assign students to write a report on the operation of the home septic tank - sewer system including the functions of vents, traps, tank, distribution box and field lines	

LESSON PLAN

6.E.10 Finishing the Structure
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 6 (NO.) LESSON: 13 (NO.) UNIT PERFORMANCE OBJECTIVE: 6.5 (CODE NO.) COMPETENCY VERIFICATION EV 6.4 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify by name common materials and processes used to finish wood frame buildings.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10	Ahead of class gather from a local building supplier examples of finishing materials such as dry wall, wood clapboards, masonite clapboards, mouldings, ceiling tile, plywood veneer paneling, carpet, underlayment, floor tile, hardwood flooring, paint, and etc.	1. Ask the class to discuss the various finishing materials used on the exterior of buildings. Summarize list on the chalk board and show examples of that materials which you have gathered.	Listen Take notes Offer observations of finishing materials they have seen
		2. Identify or describe the processes used to install exterior finishing materials - example nailed in place and painted, or laid by a mason.	Take notes Contribute to discussion
10		3. Through class discussion identify materials and processes used to finish interior walls and ceilings, summarize on the chalkboard	

LESSON PLAN (CONTINUED):

UNIT NO. 6

LESSON NO. 13

PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
5		4. Do the same for floor finishing materials	
10		5. Discuss the role of the finish carpenter/cabinetmaker showing samples of different mouldings, base boards and casings.	
5	Teacher designed assignment sheet	6. Assign students to identify materials and processes used to finish the floor of their bedroom, the floor of their bathroom, the ceiling of their living room, the walls in their kitchen, the exterior of the building they reside in and etc.	Complete assignment identifying materials and processes
		7. Announce quizzes for the next day	Study for tests

LESSON PLAN

6.A-E. Construction Competency Verification
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 6 (NO.) LESSON: 14 (NO.) UNIT PERFORMANCE OBJECTIVE: 6.1-6.4 (CODE NO.) COMPETENCY VERIFICATION EV 6.1-6.4 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to verify competencies related to construction technology

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10	Evaluation sheets 6.1-6.4 for class distribution	1. Review general areas which will be tested	Ask questions
30		2. Administer tests	Respons to test items
10		3. Review answers clarify understanding	Ask questions

LESSON PLAN

6.F.1 Simulation of Construction Roles (Formation of a Construction Firm)
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 6 (NO.) LESSON: 15 (NO.) UNIT PERFORMANCE OBJECTIVE: 6.9 (CODE NO.) COMPETENCY VERIFICATION EV 6.8 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will form a simulated construction company, and begin preparation of a "bid" to build a structure.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	Concept #11, Pages 13 - 148 in Exploring The Construction Industry by Betts, et.al.	1. Announce that the class members will become stockholders in a simulated construction corporation.	
10	Teacher selected plans for a construction project. See source above for suggestions	2. Supervision of election of a company Board of Directors, including a chairman/president, secretary/treasurer of the corporation, and two representatives of the stockholders.	Participate in election
10	Paper for stock certificates, preprinted if desired.	3. Assign secretary/treasurer to prepare stock certificates for sale to the rest of the class at $.25 each (if allowed in school system).	Complete assignment Cooperate as asked
5		4. Assign president to "hire" a vice president in charge of engineering and a superintendent of construction, and a purchasing agent.	Complete assignment Cooperate as asked

LESSON PLAN (CONTINUED): 6 UNIT NO. 15 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
20		5. Distribute plans for the project and ask the vice-president in charge of engineering to lead the class discussion regarding the overall interpretation of the plans, materials, processes, and structural details.	Lead discussion Participate in discussion Ask questions

LESSON PLAN

F.2 Estimating Construction Costs
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 6 (NO.) LESSON: 16 (NO.) UNIT PERFORMANCE OBJECTIVE: 6.8 (CODE NO.) COMPETENCY VERIFICATION EV 6.7 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to estimate the amount of raw materials needed to build a small structure from interpretation of the plans.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	Plans for structure to be built. Students should have pocket calculators available. Blank bill of materials, forms, obtained locally	1. Ask the construction superintendent to lead the class in making up a raw materials list (bill of materials) for the structure to be built, from an interpretation of the plans. Summarize on chalk board.	Lead discussion Participate in discussion Interpret plans Take notes
45		2. Assist students as needed to arrive at a complete list including nails, paint, etc.	

LESSON PLAN

6.F.2 Estimating Construction Costs
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 6 (NO.) LESSON: 17 (NO.) UNIT PERFORMANCE OBJECTIVE: 6.8 (CODE NO.) COMPETENCY VERIFICATION EV 6.7 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to estimate the costs of building materials associated with a small construction project.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
30	Bill of materials from the previous lesson. Material costs advertisement from a local building and hardware supplier, assignment sheet, teacher prepared. Students should have calculators available.	1. Distribute material cost assignment sheets for student completion 2. Ask the purchasing agent to lead the class in preparing materials cost portion of a "BID" by the student company to construction the project.	Participate in discussion Use calculators to estimate sub and total costs Interpret information in material catalogs and advertising flyers
15		3. Discuss other factors which affect the total cost of a construction project (see unit topical outline).	

LESSON PLAN

6.F.3 Preparing Bids and Contracts

(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 6 (NO.) LESSON: 18 (NO.) UNIT PERFORMANCE OBJECTIVE: 6.9 (CODE NO.) COMPETENCY VERIFICATION EV 6.8 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to describe the purpose of construction contracts, identify many of the usual clauses, and interpret a contract which they are given to read.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	Concept 13, Understanding extimating, bidding and contracting, Pages 157-189, Exploring the Construction Industry by Betts, et.al. Standard construction contract from a local building (obtained locally)	1. Describe the purpose of a contract as describing the legally binding understandings between two parties. Formal contracts may exist between: A. Client and architect B. Client and general contractor C. General contractor and sub-contractors D. Contractors and labor unions	Listen Take notes
10		2. Identify the major common clauses of a contract as follows: A. Parties involved B. Description of the work to be performed C. Standards of workmanship D. Specifications, functional requirements, etc. E. Time deadline for completion with penalities for failure	

LESSON PLAN (CONTINUED): 6 UNIT NO. 18 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
		F. Amount of total payment, and schedule of partial payments	
20	Evaluation - assignment sheet EV 6.8	3. Distribute copies of a standard contract for home construction and ask students to complete an assignment sheet requiring a reading and interpretation of the contract.	Read contract Answer questions on assignment sheet
15		4. Assign company president and officers to prepare a contractual proposal for building the small structure, incorporating the usual clauses of a contract and the previously determined material costs.	

LESSON PLAN

6.F.4. Performance of Construction Tasks
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 6 (NO.) LESSON: 19-23 (NO.) UNIT PERFORMANCE OBJECTIVE: 6.10 (CODE NO.) COMPETENCY VERIFICATION EV 6.9 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to safely perform the operations necessary to build a small structure, in a group activity environment.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	 STUDENTS
5 days	Materials for the structure, selected structural plans	1. Assist the construction superintendent in leading the class in the building of the structure following the project plans and terms of the approved contract proposal prepared by the company officers. 2. Ask company purchasing agent to cooperate with secretary/treasurer in keeping track of all expenses 3. Ask company president to "hire" a payrool clerk to keep track of laborer's time.	Role playing
	Common construction carpentry tools and equipment	4. Provide on the spot safety and procedural instruction as needed for the particular project attempted	Manipulation of tools and materials, measuring, layout, cutting, drilling-fastening, installing, finishing.
		5. Appoint a "safety Inspector" to be extra alert for safety problems and to report to teacher.	

LESSON PLAN

6.G. Careers in Construction
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 6 (NO.) LESSON: 24 (NO.) UNIT PERFORMANCE OBJECTIVE: 6.11 (CODE NO.) COMPETENCY VERIFICATION EV 6.10 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to determine the training, working conditions and life style of various construction workers.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
15		1. See detailed outline for listing of job titles. Ask class to identify occupational titles associated with the various areas of construction work. Summarize their list on the chalk board.	Respons to questions Take notes
5	Assignment sheet (teacher developed	2. Assign students to select one of the job titles listed and write a report describing the training working conditions, etc. associated with that job.	Gather data Write report
30		3. Provide assistance in finding information as needed.	

LESSON PLAN

Construction Competency Verification
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 6 (NO.) LESSON: 25 (NO.) UNIT PERFORMANCE OBJECTIVE: 6.7,8,9 (CODE NO.) COMPETENCY VERIFICATION EV 6.6,7,8 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will complete tests verifying competencies developed.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
	Evaluation sheets 6.7, 8, 9 for class distribution	1. Review general areas which will be tested	Ask questions
		2. Administer the tests	Respond to test items
		3. Review answers, answer questions	Ask questions

(EV 6.1)

NAME: ______________________ DATE: __________ SCORE: ___ ___

UPO 6.1
PART I.

INSTRUCTIONS:

Using a separate sheet of paper answer the following questions, using complete sentences.

1. Define construction.
2. Explain the difference between construction and manufacturing.
3. Identify four (4) different types of structures that are constructed.
4. What is shown in a contour or topographical map that is important when considering a construction project?
5. A plan is used to show what major view of a structure?
6. Elevations are used to show what aspects of a structure?

UPO 6.2
PART II True or False

INSTRUCTIONS:

Answer the following statements using a true or false answer.

_____ 1. Elevation drawings are used to show the inside of a building?

_____ 2. A floor plan will show how the living space of a house is arranged

_____ 3. A section drawing and a window detail are always the same thing.

_____ 4. A set of specifications are only necessary when building a commercial structure.

_____ 5. A plot plan is a drawing that shows how a building is situated on a lot.

_____ 6. If you want to know what the outside of a building will look like you need to examine the foundation plan.

PART III. Multiple choice

INSTRUCTIONS:

Select the correct letter and place it to the left in the space provided.

_____ 1. A list of building specifications will include:

A. A description of the sink to be used in the kitchen.
B. The material used to construct the front door
C. Color of exterior paint
D. All of the above

_____ 2. A topographical map

A. Shows streets, rivers, and cities.
B. Shows elevations and shapes of mountains
C. Structural details of all buildings including houses in the area
D. Specifications of materials used in a large area.
E. All of the above

_____ 3. A typical wall section will show

A. Windows
B. Plates and sills
C. Sub floor
D. Wall studs
E. All of the above

_____ 4. A complete set of drawings for even a simple storage building must include

A. Elevations
B. Floor plans
C. List of specifications
D. Wall details
E. All of the above

_____ 5. A floor plan will include

A. Location of walls, windows and doors
B. Roof framing, stairs, and an exterior view of the front of the building
C. Foundation footings, roof pitch, fireplaces and exterior wall construction
D. All of the above

(EV 6.2)

NAME: ______________________ DATE: ____________ SCORE: _____

UPO 6.3

READING STRUCTURAL DRAWINGS

INSTRUCTIONS:

Using a set of floor plans, determine the following:

1. Overall length of the structure
2. Path of travel from automobile parking area to food storage area
3. Exterior wall finish
4. Size of front door
5. Size of windows
6. Height of finish floor above grade
7. Overall width of building
8. Roof pitch
9. Is the front door facing north, south, east or west?
10. Size of living room

(EV 6.3)

NAME: ________________________ DATE: ______________ SCORE: _____

UPO 6.4

INSTRUCTIONS:

Matching: In the blank at the left of the item number, place the letter of the statement in the right column which identifies the item.

_____ 1. Carpenter
_____ 2. Equipment operator
_____ 3. Laborer
_____ 4. Client/customer
_____ 5. Plumber
_____ 6. Architect
_____ 7. Electrician
_____ 8. General contractor
_____ 9. Mason
_____ 10. Dispatcher

A. The person who commissions the architect
B. The person who designs buildings
C. One that contracts to construct buildings
D. A workman who builds wooden structures
E. One who installs electrical equipment
F. One who installs piping systems
G. One who performs work requiring minimum skills
H. One who runs a machine like a bulldozer
I. One who works with concrete blocks or stone
J. One who schedules delivery of materials

NAME: ______________________________ DATE: __________ SCORE: _____

UPO 6.5

INSTRUCTIONS:

In the space to the left choose the correct letter that makes the statement true.

PART I.

_____ 1. A Gusset is a

A. Gasket in a pipe joint
B. Short strut in roof framing
C. Plate used to strengthen the joints of a truss
D. Diagonal brace in a wall

_____ 2. A cripple is

A. A short wall stud used under a window
B. A broken rafter
C. A strut in a trussed rafter
D. The extension of a rafter over a wall

_____ 3. A doorstop is a

A. Molded strip on a door jam
B. Rubber bumper
C. Metal latch on the edge of the door
D. Half-round molding in back of the door

_____ 4. The hearth is

A. The fireplace opening
B. A wooden beam above the fireplace
C. A firebrick lining in a fireplace
D. The masonry floor in front of a fireplace

_____ 5. Glazing is

A. Placing glass in windows
B. Polishing terrazo floors to a smooth finish
C. Varnishing a natural wood finish
D. Waxing wood floors

_____ 6. The soffit is the

A. Edge of a stair flight
B. Flooring in an attic
C. Underside of a roof overhang
D. Vent pipe of basement water closet

_____ 7. A duplex outlet is

A. A double ceiling outlet
B. Two outlets side by side
C. A faucet for hot and cold water
D. A wall receptable for two electrical plugs

_____ 8. A hose bibb is

A. A hanger for the garden hose
B. Flashing for water protection
C. Exterior water outlet for a threaded hose connection
D. A splash block at the bottom of a leader

_____ 9. Which of the following pipes is commonly used in constructing a leach field.

A. Cast iron soil pipe
B. Copper pipe
C. Corrugated plastic with holes

_____ 10. In plumbing it is common practice to vent all

A. High spots
B. Low spots
C. Septic lines
D. Supply lines

UPO 6.6
PART II

INSTRUCTIONS:

In the space provided fill in the blanks to complete each statement.

1. The primary purpose of a septic tank is to provide a place where organic solids can ______________________
2. To prevent solid material in a septic tank from leaving the tank when additional waste enters. A ______________ is required.
3. A horizontal member tying opposing rafter pairs below the ridge in roof framing is called a ______________________
4. A plywood or metal plate used to strangthen the joints of a truss is called a ______________________
5. An exterior water faucet made for the threaded attachment of a hose is called a ______________________
6. The outside horizontal member on the edge of a roof or overhang is called a ______________________
7. A pipe for carrying rainwater from the roof to the ground or storm sewer connection is called a ________________
8. Horizontal framing members supporting floor areas are called ______________________
9. Vertical wall framing members are commonly called ________
10. Often a shallow space is left below the floor of a house which is above the ground. Generally this space is surrounded with the foundation wall. It is known as a ______________

PART III

INSTRUCTIONS:

In the space provided answer the following statements using true or false answers.

_____ 1. Batter boards are used when laying out the foundation of a house.

_____ 2. Studs are doubled around any opening in a frame wall.

_____ 3. The footing is that portion of a frame house upon which the foundation is placed.

_____ 4. The concrete slab floor on ground is a good type of construction to use in areas having high water problems.

_____ 5. Swampy ground is an excellent place to install a leach field.

_____ 6. The essential parts of a private waste disposal system are a septic tank and a leach bed.

_____ 7. A trap is used on drain lines to prevent back flow of sewer gases.

_____ 8. Rafters generally are used to support wall areas.

_____ 9. A roof with a 1/6 pitch is steeper than one with a 1/4 pitch.

_____ 10. Wood roof trusses can be designed to span greater distances than simple rafters with no center support.

(EV 6.5)

NAME: ______________________ DATE: ______________

UPO 6.6

EVALUATION OF TERM PAPER/WRITTEN REPORT

	DONE VERY WELL	SATIS-FACTORY	MORE WORK NEEDED	NOT APPLI-cable
A. CONTENT				
1. Covered chosen subject thoroughly				
2. Major points well organized				
3. Purpose of paper made clear				
4. Conclusion or summary well thought out				
B. FORM/GRAMMAR				
1. Outline done according to accepted form				
2. Acceptable punctuation and spelling				
3. Sentences and paragraphing clear grammatical construction				
4. Quotation and citations done properly				
5. Footnotes done according to accepted form				
6. Bibliography done according to accepted form				
C. RESEARCH TECHNIQUE				
1. Good variety of source material				
2. Authorities given to substantiate opinions				
3. Paper shows writer has done ample reading on the subject				

(EV 6.6)

NAME: ______________________ DATE: __________ SCORE: _____

UPO 6.7

INSTRUCTIONS:

Using a set of working drawings for the tool shed answer the following questions:

1. What is the overall length of the building? ______________
2. What is the size of the access door? ____________________
3. What is the maximum amount of interior head room? ________
4. What material is used to make the floor ________________
5. What are the electrical switches located? ______________
6. What wall covering material and finish are specified? _____ ____
7. What material is used for rafters? ______________________
8. What is the covering over the roof seathing? ____________
9. Where are the lights located? __________________________
10. What is the size of the window? ________________________

(EV 6.7)

NAME: ______________________ DATE: ____________ SCORE: ____

UPO 6.8

INSTRUCTIONS:

Cost Extimate

	YES	NO
Was work completed?	___	___
Estimate of materials needed	___	___
Sources of supply, local market	___	___
Cost estimate of materials	___	___

QUALITY OF WORK	EXCELLENT	GOOD	ACCEPTABLE	UNACCEPTABLE
Information presented				
Accuracy				

REMARKS: ____

(EV 6.8)

NAME: ______________________ DATE: __________ SCORE: _____

UPC 6.9

INSTRUCTIONS:

Using a separate sheet of paper, answer the following in complete sentences.

1. Describe the purpose of construction contracts.
2. Identify the most common clauses in a construction contract.
3. Using the contract that you have been given interpet it to answer the following questions.
    A. Describe the location of the building.
    B. How is payment to be made?
    C. When is payment to be made?
    D. Who shall be responsible for the quality of work performed?
    E. What plans are to be used?
    F. Who is responsible for signing the contracts?

(EV 6.9)

NAME: ________________ DATE: ______________ SCORE: ______

UPO 6.10

CONSTRUCTION OPERATIONS

TASKS	UNABLE TO PERFORM	PERFORMED ACCEPTABLE	UNUSUAL SKILL DISPLAYED
Measuring			
Layout			
Sawing (hand or circular)			
Drilling or boring (hand or elec.)			
Structural placement			
Nailing			

REMARKS: ____

____

____

____

NOTE: Also see EV 1.2

(EV 6.10)

NAME: ______________________________ DATE: ____________________

UPO 6.11

EVALUATION OF TERM PAPER/WRITTEN REPORT

	DONE VERY WELL	SATIS-FACTORY	MORE WORK NEEDED	NOT APPLI-cable
A. CONTENT				
1. Covered chosen subject thoroughly				
2. Major points well organized				
3. Purpose of paper made clear				
4. Conclusion or summary well thought out				
B. FORM/GRAMMAR				
1. Outline done according to accepted form				
2. Acceptable punctuation and spelling				
3. Sentences and paragraphing clear grammatical construction				
4. Quotation and citations done properly				
5. Footnotes done according to accepted form				
6. Bibliography done according to accepted form				
C. RESEARCH TECHNIQUE				
1. Good variety of source material				
2. Authorities given to substantiate opinions				
3. Paper shows writer has done ample reading on the subject				

INSTRUCTIONAL PLAN

UNIT SEVEN

7	Energy, Power and Transportation	6 weeks total
	A. Basic definitions and concepts 1. Forces 2. Torques - turning forces (force x radius of rotation arm) 3. Work - (force x distance moved) 4. Potential energy (ability to do work if released) 5. Kinetic energy (energy of mass in motion) 6. Efficiency of energy conversions	1 day
	B. Basic principles of force control	
	1. Simple machines that can increase force of change its direction a. Inclined plane b. Wedge c. Screw d. Lever e. Wheel and axle f. Pulley and rope, belt or chain g. Applications of simple machines	2 days
	C. Hydraulic-pneumatic principles 1. Pressure definition (Force/unit area) 2. Pressure distribution in an enclosed fluid 3. Cylinder, piston and fluid systems a. Force on piston = pressure in fluid x area of piston b. Volumes of cylinder displacements when moved c. Increased force - small piston hydraulically driving a large piston d. Increased distance - large piston hydraulically driving a small one 4. Applications of hydraulics and pneumatics	

7 Energy, Power and Transportation (Cont.)

- D. Solar - direct and long range — 4 days
  - 1. Energy storage through photosynthesis in plants
    - a. Food production
    - b. Plant fuel - wood
    - c. Fossil fuel - oil
  - 2. Generation of wind
  - 3. The rain water cycle
  - 4. Solar energy storage systems
  - 5. Wind energy
    - a. Sail boats
    - b. Wind mills of various types and applications
    - c. Cooling and ventilation
  - 6. Water - Hydro power
    - a. Historical types and applications
      - (1) Overshot wheel
      - (2) Breast wheel
      - (3) Undershot wheel
      - (4) Impulse turbine
      - (5) Reaction turbine
    - b. Water power storage and distribution systems
      - (1) Dams, lakes
      - (2) Pumped pools
      - (3) Electrical generation
- E. Fire safety for home heating — 1 day
  - 1. Combustion systems
    - a. Space heat
    - b. Cooking
    - c. Hot water
  - 2. Fuels
    - a. Natural gas
    - b. Oil
    - c. Wood stoves
    - d. Fire places
  - 3. Safety precautions
    - a. Fuel handling
    - b. Exhaust gases
    - c. Combustion oxygen - ventilation
    - d. Fire hazards and precautions
- F. Steam power — 1 day
  - 1. Historical importance
    - a. Factories
    - b. Ships
    - c. Locomotives

7 Energy, Power and Transportation (Cont.)

- 2. Types
  - a. Piston
  - b. Turbine
- 3. The steam cycle
  - a. Heat sources
  - b. Heat exchangers
  - c. Steam expansion to mechanical power
  - d. Condensation
  - e. Pumped re-entry of water to boiler

G. Internal combustion engines — 4 days
- 1. The four stroke cycle
- 2. Major engine parts, names, and functions
  - a. Cylinder
  - b. Piston
  - c. Connecting rod
  - d. Crankshaft
  - e. Valves-intake and exhaust
  - f. Firing chamber
  - g. Spark plug
  - h. Cam shaft
  - i. Carbuetor system
  - j. Ignition system
  - k. Lubrication system
- 3. Characteristics - applications
- 4. Service on small engines
  - a. Change oil
  - b. Change/clean air filter
  - c. Change/clean spark plug
  - d. Adjust idle speed

H. Power line safety for the citizen — 1 day
- 1. Auto-power pole accidents
- 2. Kites, ladders, roof climbing
- 3. Switches, fuses, circuit breakers
- 4. Portable power tools
- 5. Ground fault intrupters
- 6. First aid for shock victims

I. Electrical power measuring units — 2 days
- 1. Definitions of voltage, current and resistance
- 2. Ohm's Law
- 3. Measuring units with a multi-meter
- 4. Safety considerations

7 Energy, Power and Transportation (Cont.)

- J. Major modes of transportation — 1 day
  - 1. Modern needs for transportation
  - 2. Rail systems
    - a. Advantages
      - (1) Low friction losses efficient
      - (2) Large weight capacities
      - (3) Relatively high reliability and safety in bad weather
      - (4) Relatively fast
      - (5) Low pollution
      - (6) Low numbers of operating personnel per person moved
    - b. Disadvantages
      - (1) High initial investment
      - (2) Inflexibility in routes and station points
  - 3. Highway systems-buses
    - a. Advantages
      - (1) Lower initial investment
      - (2) Great flexibility in routes and stations
    - b. Disadvantages
      - (1) Pollution
      - (2) High personnel costs-one driver per bus
      - (3) More friction-less efficient
      - (4) Somewhat dependent on weather and other traffic
  - 4. Water transportation — 1 day
    - a. Floating structures - bouyancy principle
      - (1) Rafts, boats, ships, submarines
      - (2) Propulsion systems
        - (a) Oars
        - (b) Sails
        - (c) Paddle wheels
        - (d) Propellers
        - (e) Outboard engines
        - (f) Inboard engines
        - (g) Steam
        - (h) Nuclear

7 Energy, Power and Transportation (Cont.)

b. Canal and lock systems
c. Advantages of water transportation
(1) Efficient transport of large loads
(2) Long life of units
d. Disadvantages of water transportation
(1) Slow
(2) Limited inland routes
(3) High initial cost, particularily for in-land use
(4) Can be weather dependent and/or hazardous
5. Airplane transportation
a. Principles of flight control
b. Lift from wings - airfoils and Bernoulli's Principle
c. Advantages of air transportation
(1) Speed
(2) Unlimited routing
(3) Transport over geological barriers
d. Disadvantages
(1) Must have take-off-landing runways
(2) Somewhat weather dependent
(3) Expensive per unit of weight carried
K. Aero-space transportation 2 days
1. Rocket propulsion principles
a. Action re-action
b. Fuels
2. Gravitational fields, orbits, speed and distances
3. Life support systems
a. Environment control-pressure, temperature, breathing air
b. Food and waste products
c. Weightlessness effects on the mind and body
d. Psychological and social considerations
4. Space shuttle operation
a. Launching
b. Space link up
c. Return and re-entry
d. Earth transport and service for next launch

7 Energy, Power and Transportation (Cont.)

- L. Careers in Energy/Power and Transportation — 2 days
  - 1. Manufacturing personnel (see manufacturing unit)
    - a. Engineers - Industrial
      - Mechanical
      - Electrical-Electronic
      - Automotive
      - Aero-space
      - Designers
    - b. Technicians - Electrical-mechanical
      - N/C Programmers
      - Computer Programmers
      - Drafters
    - c. Corporate management -
      - Personnel managers
      - Accountants
      - Plant managers
      - Secretaries
      - Clerks
      - Purchasing agents
      - Foremen
      - Inspectors
    - d. Labor - Skilled tradesmen-all kinds
      - Semi-skilled workers
      - Operators
      - Unskilled material handlers
      - Janitorial maintenance
  - 2. Salespeople
    - a. Manufacturing materials
    - b. Vehicles - produce salespeople
    - c. Repair, maintenance, service, supply, sales
    - d. Travel agent
    - e. Ticket sales
    - f. Concession operator
    - g. Market analyst
    - h. Graphic artists
  - 3. Dispatching, scheduling, routing personnel
    - a. Civil engineers
    - b. Need demand
    - c. Traffic controllers
    - d. Radio dispatchers
    - e. Routing clerks
    - f. Traffic engineers
    - g. Map drafters

7 Energy, Power and Transportation (Cont.)

4. Construction personnel (see construction unit)
    a. Civil engineers
    b. Architects
    c. Mechanical engineers
    d. Surveyers
    e. Heavy equipment operators - bull dozers, dump trucks, etc.
    f. All skilled trades
    g. Un-skilled material handlers
    h. Pole setters
5. Personal service occupations
    a. Stewardresses
    b. Stewards
    c. Security guards
    d. Cooks
    e. Maids-cabin boys
    f. Laundry operators
    g. Cooks-food handlers
    h. Cash register clerk
    i. Repair-service personnel
    j. Guides
    k. Baggage handlers, clerks, bellhops
6. Vehicle operating personnel
    a. Drivers-bus, truck, taxi, delivery
    b. Pilots, co-pilots, captains
    c. Conductors - train, subway, etc.
    d. Locomotive engineer, fireman, breakman
    e. Astronaut
    f. Deck hand
7. System operation and maintenance personnel
    a. Console monitor
    b. Mechanics - automotive, aircraft, marine
    c. Lubrication specialists - oilers
    d. Track and bed repair
    e. Linesmen - pole setters
    f. Electrician - technician
    g. Painters, scrapers
    h. Steam fitter
    i. Plant operating engineer
    j. Service manager

UNIT PERFORMANCE OBJECTIVES

UNIT SEVEN

UNIT PERFORMANCE OBJECTIVES		EVAL INSTRUMENT CODE
UNIT 7	Energy, Power and Transportation	
7.1	Students will be able to recognize the technical terms and concepts used to describe, measure, or explain principles, mechanisms, and systems associated with energy and power control with 80% accuracy on an objective test.	EV 7.1
7.2	Students will be able to explain how hydraulic - pneumatic systems can increase mechanical force, describing the functions of the drive piston/cylinder or pump, valves, the driven cylinder/piston and the high pressure lines when asked to do so in a written exercise.	EV 7.2
7.3	Students will be able to identify building and automobile jacks, hoists, vehicle brakes, and earth moving equipment as major applications of hydraulic/pneumatic principles when asked to do so on a written exercise.	EV 7.2
7.4	Students will be able to explain the energy conversions which trace wind, water and combustion fuel sources back to the sun as an ultimate source/cause, when asked to do so on a written exercise.	EV 7.3
7.5	Students will be able to identify the function of the various parts of a passive solar hot water heater for a domestic home when asked to do so on a written exercise.	EV 7.4
7.6	Students will be able to identify at least two applications of wind power and describe the system used to develop wind power in each case.	EV 7.5
7.7	Students will be able to identify the functions of the following components of a water based energy system; weather, streams/rivers, dams, wheels and turbines, gates, electrical generators when asked to do so on a written exercise.	EV 7.5

UNIT PERFORMANCE OBJECTIVES

UNIT 7 Energy, Power and Transportation (Cont.)

7.8	Students will be able to answer questions regarding the safe combustion of fuel (solid or liquid) in domestic homes for direct heat and light with 80% accuracy.	EV 7.6
7.9	Students will be able to identify the function of each of the following components of a steam based power systems: Fuel-fire box, heat exchanger - boiler, lines and manifolds, turbines, condensor, return pump, and generator, when asked to do so on a matching quiz with 80% accuracy.	EV 7.7
7.10	Students will be able to associate the name of each of four stroke cycles of an internal combustion engine with a brief description of that cycle when asked to do so on a matching quiz with 80% accuracy.	EV 7.7
7.11	Students will be able to match the names of the main parts of an internal combustion engine with brief descriptions of the functions of those parts when asked to do so on a matching quiz with 80% accuracy.	EV 7.7
7.12	Students will be able to perform the following services to a small internal combustion engine; change oil, change/clean spark plug, change/clean air filter, and adjust idle speed. Ability will be verified on check off assignment sheet by instructor following student performance of these operations, working in groups of two or three.	EV 7.8
7.13	Students will be able to recognize the main components of the commercial electrical power distribution system serving their neighborhood, and describe their main purpose or function. Competency will be demonstrated by completion of an assignment sheet requiring the precise location of one example of each component in their neighborhood and a written description of functions, acceptable to the instructor.	EV 7.9

UNIT PERFORMANCE OBJECTIVES

UNIT 7 Energy, Power and Transportation (Cont.)

7.14	Students will be able to answer questions regarding electrical safety in the home and shop with 100% accuracy.	EV 7.10
7.15	Students will be able to identify at least one advantage and at least one disadvantage or problem associated with each of the following modes of transportation; railroads, automobiles, buses, boats, and airplanes when asked to do so on a written test.	EV 7.11
7.16	Students will be able to answer questions regarding the principles of operation and propulsion of air, land, sea and space vehicles with 80% accuracy.	EV 7.11
7.17	Students will be able to identify and describe a career associated with energy/power/transportation which would be capable of entering in terms of initial training, main tasks/responsibilities, working conditions, and life style. Competency will be verified by submission of a written report acceptable to the instructor.	EV 7.12
7.18	Students will be able to define and measure electrical quantities with a multimeter as exhibited by a laboratory report.	EV 7.13

LESSON PLAN

7.A Introduction to Energy/Power/Transportation
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 7 (NO.) LESSON: 1 (NO.) UNIT PERFORMANCE OBJECTIVE: 7.1 (CODE NO.) COMPETENCY VERIFICATION EV 7.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be provided an overview of experiences and activities associated with the unit and be motivated to master competencies related to Power/Energy/Transportation.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
10	Unit content and requirement sheets (teacher developed). Introduction to Power Systems by Suess, Dugger, Patrick and Ziegler, Lesson 13, Pages 55, 56.	1. Distribute and discuss an information sheet outlining the major divisions of content in the unit and describing the various required activities (see detailed topical outline for this unit). 2. Ask students to bring (or have available) a hand held calculator for the unit duration	Listen Read Ask questions Take notes
15	Any dictionary	3. On the chalk board define and give examples to illustrate the following terms and concepts A. Forces (1) Wt-Gravity (2) Lbs, grams, Kilograms (3) Pushing forces (compression) (4) Pulling forces (tension)	Listen Ask questions Take notes

LESSON PLAN (CONTINUED): 7 UNIT NO. 1 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
		B. Torques or moments - turning forces. (Force x distance from center of rotation) C. Work (Force x Distance) D. Potential energy (ability to do work or energy of position) E. Kinetic energy (energy of a mass in motion) F. Power-time rate of doing work G. Efficiency, a comparison of input energy vs output energy. $\% \text{ efficiency} = \frac{\text{energy out}}{\text{energy in}} \times 100$	
25		3. Assign students to read about simple machines	Read pages 61 to 85, Introduction to Power Systems by Suess, et al.

LESSON PLAN

7.B.1. Simple Machines
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 7 (NO.) LESSON: 2 (NO.) UNIT PERFORMANCE OBJECTIVE: 7.1 (CODE NO.) COMPETENCY VERIFICATION EV 7.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify the simple machines and describe at least one application of each.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	 STUDENTS
10	Demonstration aids - A pry bar, a wedge, a screw type jack, wheels and axles from erector or tinker toy sets. String and pulleys from erector or tinker toy sets, small spring scales for measuring weight or tension, soup can or other heavy, small cylinder, known weights or brick.	1. Identify and demonstrate the basic principle of operation of each of the following simple machines. Ask students to recall applications of these devices which they have observed and summarize their observations on the chalk board. A. Inclined plane B. Screw C. Lever D. Wedge E. Wheel and axle F. Rope and pulley	Observe Take notes Respond to questions
15	Laboratory assignment sheet, teacher prepared. "EXPLORATIONS", Page 62 of Intro to Power Systems by Suess, et al.	2. Mathematics of simple machines. Assign students to lift a known weight with a first class lever, measuring the force needed and verifying the formula: lifting arm distance x lifting force = load distance x load force	Complete laboratory assignment and report

LESSON PLAN (CONTINUED): 7 UNIT NO. 2 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
15	Teacher designed assignment sheet "EXPLORATIONS", page 73 of Intro to Power Systems by Suess. et at.	3. Assign students to lift a known load with a pulley system, verifying that the load force is equal to tension on one string x number of strands supporting the load.	Complete assignment and report.

LESSON PLAN

7.B.1 Mathematical Calculation of Mechanical Advantage and Efficiency of Simple Machines
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 7 (NO.) LESSON: 3 (NO.) UNIT PERFORMANCE OBJECTIVE: 1.1 (CODE NO.) COMPETENCY VERIFICATION EV 1.1 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to solve problems involving the mechanical advantage, input force, load force and efficiency of simple machines.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5	Lab reports from the previous day	1. Using results of the laboratory exercise of the previous day, review the concept of work as Force x Distance and lead the class in calculating the input and output work for both the lever and the pulley system.	Listen Calculate input and output work
5		2. Using the formula $\% \text{ Efficiency} = \frac{\text{output work}}{\text{input work}} \times 100$ lead the class in calculating the efficiency of the lever and the pulley system.	Calculate efficiency
5		3. Discuss the mechanical advantage, or force multiplying effect of simple levers and pulley systems. Lead the class in calculating the mechanical advantage of the pulley and lever systems. $\text{Mech. Advantage} = \frac{\text{Force out}}{\text{Force in}}$	Calculate mechanical advantage

LESSON PLAN (CONTINUED): 7 UNIT NO. 3 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
35	Teacher prepared assignment sheet	4. Assign students to solve problems related to mechanical advantage, input force, output force, distance input force travels, distance output force travels, efficiency, input work and output work	Solve math problems as assigned.

LESSON PLAN

7.C.1-4. Hydraulic - Pneumatic Principles
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 7 (NO.) LESSON: 4 (NO.) UNIT PERFORMANCE OBJECTIVE: 7.2;7.3 (CODE NO.) COMPETENCY VERIFICATION EV 7.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to explain how hydraulic/pneumatic systems can increase force and identify major applications of hydraulic and pneumatic principles.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10	Pages 109-130 in Intro to Power Systems by Suess, et al. Deflated inner tube or basket ball and piece of 3/4" plywood big enough to cover it, hand tire pump, tire gage	1. Demonstrate how fluid pump can increase force by placing the deflated inner tube under the plywood and having two heavy class members stand on it while a small member of the class lifts them by pumping up the tube.	Observe Participate
		2. Ask the class to describe the function of the valve in preventing loss of air with each stroke.	Respond to question
5		3. Ask the class to estimate the input force, the output force and the mechanical advantage of the system. (This can only be done crudely because of leakage in the pump when it is operated slowly)	Calculate mechanical advantage

LESSON PLAN (CONTINUED): 7 UNIT NO. 4 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
		4. With the load still on the plywood, measure the pressure of the air in the tube.	Measure pressure.
5		5. Demonstrate that pressure - lbs/sq.inch, can exert greater force when applied over a larger area - like the big automobile hoist.	
		6. Point out that fluid pressure can be conducted anywhere it is needed by compact high pressure lines or hoses.	
20		7. Assign the class to brainstorm in small groups identifying as many applications of hydraulics/ pneumatics as they can think of.	Participate in groups, Generate lists of applications
10		8. Ask groups to report and consolidate lists.	

LESSON PLAN

7.C.1-4 Mathematics Applied to Hydraulic/Pneumatic Systems
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 3

UNIT: 7 (NO.) LESSON: 5 (NO.) UNIT PERFORMANCE OBJECTIVE: 7.2;7.3 (CODE NO.) COMPETENCY VERIFICATION EV 7.2 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to solve problems involving the areas and forces on driving and driven pistons, relative amounts of piston travel, and pressure necessary to exert a given force.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10	Hand held calculators, small hydraulic jack. Colipers, scale. Lesson 28, "Closed Fluid Power Systems" Pages 120 to 130, Intro to Power Systems by Suess, et al.	1. Using the jack as a teaching model, guide students in determining its hydraulic mechanical advantage. A. Measure diameter of lifting piston and hand operated pump piston with calipers and scale. B. Area = πR^2 sq. inches, for each piston respectively C. Pressure "P" on both small (driver) and big (driven) piston is always equal. D. Force on each piston F in = Px area (small) F out = Px area (large)	Measure Calculate and record as directed

LESSON PLAN (CONTINUED): 7 UNIT NO. 5 LESSON NO. PAGE 2 OF 3

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
		E. Mechanical advantage = $\frac{F\ out}{F\ in}$ Mechanical advantage = $\frac{Px\ area\ (large)}{Px\ area\ (small)}$ Mechanical advantage = $\frac{area\ large}{area\ small}$	
		Note that in addition to a hydraulic mechanical advantage, on our jack, the small piston is driven by lever action which provides additional mechanical advantage.	
		F. Mechanical advantage of system = MA. (hyd) x MA (lever)	
10		2. Explain hydraulic brake system. A. Foot pedal lever B. Master cylinder creates pressure C. Brake lines transfer pressure to wheels (evenly to each wheel) D. Wheel cylinders operate the brakes	Listen Take notes

LESSON PLAN (CONTINUED): 7 UNIT NO. 5 LESSON NO. PAGE 3 OF 3

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
5		3. Compare volume and travel of large and small cylinders. $V = \pi R^2 L$. (cubic inches) A. The small cylinder requires many strokes to fill the large cylinder B. A large piston driven by a smaller one will move slower C. A small piston driven by a larger one will move much faster (traditional BB gun) with a mechanical advantage less than 1.0. D. Amount (volume) of fluid moved from one cylinder is always equal to the amount (volume) entering the other.	Calculate volumes of cylinders
25	Teacher prepared assignment sheet	4. Assign students to solve math problems dealing with hydraulic systems	Math calculations as assigned

LESSON PLAN

7.D.1-6 Solar Energy
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 7 (NO.) LESSON: 6,7 (NO.) UNIT PERFORMANCE OBJECTIVE: 7.4 (CODE NO.) COMPETENCY VERIFICATION EV 7.3;7.5 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify the energy conversions which trace wind, water, and combustion energy sources back to the sun as the ultimate source of earth's energy.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
50	General Power Mechanics by Crouse, Worthington, Margules and Anglin. Old magazines for pictures. Large poster boards, paste or tape, felt tip markers. Sissors.	1. Divide the class into 5 working committees. Assign each committee to produce a poster-chart tracing and illustrating the role of the sun and other energy conversions in producing the following common sources of energy. (one source per group) A. Water power B. Wind power C. Oil/petroleum D. Coal E. Wood For example: the sun causes uneven heating of the earth's surface which causes uneven expansion and contraction of the air in the atmosphere which we call wind, then wind energy is captured by a wind mill and used to generate electricity or pump water.	Gather data and pictures Organize visual presentation Finish poster

LESSON PLAN (CONTINUED): 7 UNIT NO. 6,7 LESSON NO.

PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
50		2. When finished, display the posters and discuss the energy transfers in each case.	Observe and react to the works of others Take notes

LESSON PLAN

7.B.4. Solar Energy Water Heaters
(TOPICAL OUTLINE CODE NO. AND TITLE)

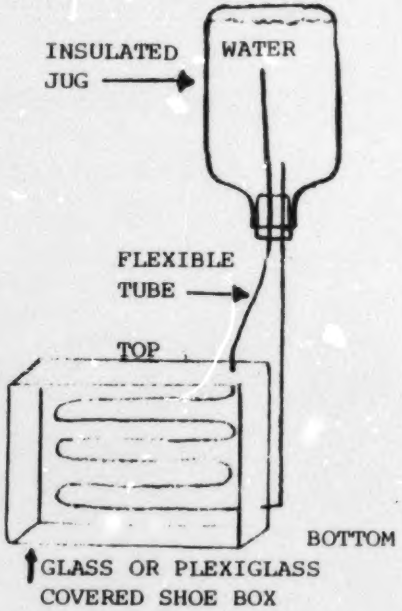
PAGE 1 OF 2 .

UNIT: 7 (NO.) LESSON: 8,9 (NO.) UNIT PERFORMANCE OBJECTIVE: 7.5 (CODE NO.) COMPETENCY VERIFICATION EV 7.4 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify the function and parts of a passive solar hot water heater.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
30	Overhead transparency made from EV. sheet 7.4, colored and with labels on parts (teacher made)	1. Using the transparency, explain the energy collection system and the flow of water in a passive hot water system. A. Warmer water rises to the top B. Cold water settles to the bottom. C. Cold water supply enters the bottom of the collector D. The warmest water enters the auxiliary heater "cold" water supply reducing greatly the amount of commercial energy needed to heat it further for home use. E. Valves are needed to bypass the system in cold weather. F. Provision must be made to drain the system for freezing protection.	Observe Listen Take notes Ask questions

LESSON PLAN (CONTINUED): 7 UNIT NO. 8,9 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
5		2. Review by pointing to various parts of the system diatram and ask students to name the parts and describe their function.	
65	Thermometers, gallon glass jugs, two hole stoppers, glass or brass laboratory tubing, shoe boxes	3. Assign students to work in small groups setting up a demonstration solar collector system using flexible laboratory tubing in a glass covered shoe box. Use gallon jug (inverted) with two whole stopper as a storage unit. Measure temperature rise of water	Assemble apparatus, measure temperature rise, report.  INSULATED JUG WATER FLEXIBLE TUBE TOP BOTTOM GLASS OR PLEXIGLASS COVERED SHOE BOX

LESSON PLAN

7.E. Fire Safety for Home Heating
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 7 (NO.) LESSON: 10 (NO.) UNIT PERFORMANCE OBJECTIVE: 7.8 (CODE NO.) COMPETENCY VERIFICATION EV 7.5 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify safety precautions associated with direct combustion of fuel for home heating.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
50	The local fire marshall may consent to be a guest presenter of this session.	1. Identify and explain the basic operation of the most common types of home combustion systems. A. Natural gas (1) hot water (2) cooking (3) space heating Precautions: Unblocked haust vents, proper adjustment of pilot light, check for leaks, odors, keep combustionable materials away from such devices. B. Oil - largely for space heating furnaces, Precaution: clean exhause vents and fireboxes, be alert to leaks. Kerosene (Portable heaters). Provide ventilation for combustion oxygen, human breathing and dissipation of exhaust gases. Place away from walls, [illegible]apes and other	Listen Ask questions Take notes

LESSON PLAN (CONTINUED):

UNIT NO. 7

LESSON NO. 10

PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
		burnables. Be alert to floor materials, carpet, etc. take care in filling and fuel handling (no spills). No horseplay, tipping unit over, etc. C. Wood Space heaters Precautions: Clean chimney regularily. Provide adequate ventilation for combustion. Place over non-combustionable floor materials and away from walls, drapes, etc. Clean up burnable scraps which accumulate. Use care in removing ashes and coals which may provide a personal burn or a fire hazard to the building if spilled. Don't use stove surface as a storage location. D. Fire places Precautions: Provide ventilation for combustion air. Use fire screen to help control flying hot coals. Do not leave house with fire going. Clean up combustionable scrape which accumulates. Keep chimney clean. Use care in removing ashes. Store insect infested firewood away from the home.	

LESSON PLAN

7.A - E Competency Verification
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 7 (NO.) LESSON: 11 (NO.) UNIT PERFORMANCE OBJECTIVE: 7.1 - 7.8 (CODE NO.) COMPETENCY VERIFICATION EV 7.1-7.6 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to verify competencies related to power and energy.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
10	Evaluation sheets 7.1 to 7.6 for class distribution as needed	1. Review competencies to be evaluated	Listen Ask questions
30		2. Administer tests	Respond to questions
10		3. Collect tests and clarify understanding	Ask questions

LESSON PLAN

7.E Steam Engines
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 7 (NO.) LESSON: 12 (NO.) UNIT PERFORMANCE OBJECTIVE: 7.9 (CODE NO.) COMPETENCY VERIFICATION EV 7.7 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify the parts of a steam power plant and describe the purpose of each part.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
	Chapter 3 in *General Power Mechanics* by Crouse, et al. *World Book Encyclopedia*, Volume 1, Page 834, has a good diagram also Vol. 1, Page 842	1. Explain that steam plants have been major power producers for hundreds of years in: A. Industrial factories B. Ships C. Locomotives D. Commercial electrical power generation 2. Explain that the turbine is the most efficient form of the engine. 3. Trace the energy storage and conversion processes through the various components of a modern steam generator plant. A. Fuel - coal, oil neuclear-chemical or atomic storage of potential heat energy B. Fire box or reactor - produces heat from fuel	Listen Take notes

LESSON PLAN (CONTINUED):

7
UNIT NO.

12
LESSON NO.

PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	 STUDENTS
		C. Boiler/heat exchanger - converts heat from fuel to charge of physical state of water - steam D. Steam lines and mainfolds - conduct steam to the turbines input ports E. Turbine - converts kinetic energy of expanding steam into rotary mechanical motion (turns generator) F. Condensor - a space for the expanded (spent) steam to convert back to water, cooling towers enhance this process G. Condensate pump - increase the pressure of the water so that it can re-enter the high pressure boiler 4. Assign students to read chapter 3, in General Power Mechanics by Crouse, worthington and Anglin	

LESSON PLAN

7.G.1-3 The Internal Combustion Engine - 4 cycle
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 2

UNIT: 7 (NO.) LESSON: 13,14 (NO.) UNIT PERFORMANCE OBJECTIVE: 7.10;7.11 (CODE NO.) COMPETENCY VERIFICATION EV 7.7 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify the name and describe the function of each of the four strokes in a four cycle internal combustion engine.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
10	Chapter 9, "Four Cycle Engines - operation and types" from General Power Mechanics, Crouse, et al. Unit 4 and Unit 6 from The Basic Book of Power Mechanics by Jay Webster.	1. Using the chalk board or the overhead projector illustrate and explain the operation of the piston, valves, crankshaft and combustion gases, and spark plug during each of the four cycles A. Intake B. Compression C. Power D. Exhaust	Listen Take notes
70	Old, small four cycle engines. Teacher pre-par[illegible] assignment sheet. Blank pressure sensitive labels.	2. Assign students to work in groups while disassembling a four cycle engine and naming each part with pressure sensitive labels. Ask each group to develop a list of each part and a description of its purpose.	Dissemble with common mechanical tools Catalog parts and describe functions.

LESSON PLAN (CONTINUED): 7 UNIT NO. 13,14 LESSON NO. PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
20	Common mechanical tools	3. Assign groups to re-assemble engines after labeling process. Notice: no real attempt at overhaul or repair is intended, just familarity with parts and functions.	Assemble parts with common tools

LESSON PLAN 7.G.4. Servicing Small Engines
(TOPICAL OUTLINE CODE NO. AND TITLE) PAGE 1 OF 2

UNIT: 7 (NO.) LESSON: 15,16 (NO.) UNIT PERFORMANCE OBJECTIVE: 7.12 (CODE NO.) COMPETENCY VERIFICATION EV 7.8 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to perform routine consumer service on a small internal combustion engine - clean/replace plug; clean/replace air filter, change oil, adjust idle speed.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
20	Small engines which are operable, student may bring in their own. Spark plug sockets, spark gap gauge, plug file or abrasive cloth, cleaning brush and screw driver, oil and gasoline.	1. Explain to students that they will be performing "live" service procedures	Observe Take notes
	Unit 24 Pages 89-91 Basic Book of Power Machines by Jay Webster	2. Demonstrate the following stressing safety precautions A. Clean/replace air filter. Safety - Eye protection chemical/flammable solvent handling.	
	Unit 15, Pages 59 - 62, Basic Book of Power Machines by Jay Webster	B. Clean/replace spark plug. Safety - protect spark plug hole from dirt falling into the cylinder. Eye protection. Use proper plug socket. Set gap very carefully, do not break plug electrodes.	

LESSON PLAN (CONTINUED):
UNIT NO. 7
LESSON NO. 15,16
PAGE 2 OF 2

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
	Unit 17, Pages 67-69, and Unit 25 Pages 93-95 of Basic Book of Power Machines by Jay Webster	C. Adjust carburetor. Idle speed jet. Safety - keep hands and feet clear of moving parts and spark plug lead. Eye protection. Use very little torque on jet screw to prevent damage.	
	Unit 31, Pages 111-112 Basic Book of Power Machines by Jay Webster	D. Change oil Safety - Don't spill old or new oil. Clean up any spilled oil immediately. Cleaning cloth or paper towels disposed of in covered containers. Old oil put in proper container (not down the drain, or dumped on the ground)	
80	Teacher prepared assignment sheet	2. Assign students to perform service operations in small groups	Perform service tasks

LESSON PLAN

7.H. Power Line Safety for the Citizen
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 3

UNIT: 7 (NO.) LESSON: 17 (NO.) UNIT PERFORMANCE OBJECTIVE: 7.13;7.14 (CODE NO.) COMPETENCY VERIFICATION EV 7.9;7.10 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to recognize the components of the commercial power system serving their home and neighborhood and be able to answer questions regarding electrical safety for the average citizen.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	 STUDENTS
10	Fig 14-5, Page 66, Electricity by Howard Gerrish, Goodheart-Wilcox Build a course series.	1. Review the role of the following in bringing electrical power to the home. A. Generating plant B. Step up transformers C. High voltage lines D. Step down transformers, distribution sub-stations E. Medium voltage (neighborhood) transmission lines F. Step down transformers for home use, single phase G. Service drop H. Meter I. Home distribution panel J. Circuit breaker/fuses K. Branch circuits (1) Convenience outlets (110V) (2) Lamps (110V) (3) Direct wired appliances (220V)	Listen Take notes

LESSON PLAN (CONTINUED): 7 UNIT NO. 17 LESSON NO. PAGE 2 OF 3

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
		2. Explain that the earth is a massive conductor holding a constant "O" potential. "Hot" AC power lines are sometimes positive and sometimes negative with respect to the earth ground. A shock is just as dangerous in either direction.	
20		3. Ask the class to identify the hazard and the safe action to take in each of the following situations. Help them and explain as needed. A. Child's kite tangles into power line. B. Car hits power pole C. Storm causes tree to fall on to power line D. Storm causes power line to fall to the ground E. Home owner wants to use electric hedge trimmer in a misty rain	Analyze situations and respond to questions

LESSON PLAN (CONTINUED): 7 UNIT NO. 17 LESSON NO. PAGE 3 OF 3

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
		F. Shallow puddle of water exists on home workshop floor. G. Toaster, electric skillet and microwave oven all used at the same time blows a fuse	
5		4. Explain the purpose of ground fault interrupters	
10		5. Explain first aid treatment for electric shock victims A. Call for help B. Restore breathing and heart function - mouth to mouth and CPR C. Protect burns	
5		6. Assign students to complete assignment/evaluation sheet requiring the identification and description of electrical components in their neighborhood	

LESSON PLAN

7.I. Electrical Power Measuring Units
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 3

UNIT: 7 (NO.) LESSON: 18,19 (NO.) UNIT PERFORMANCE OBJECTIVE: 7.18 (CODE NO.) COMPETENCY VERIFICATION EV 7.13 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to distinguish among the terms volts, amperes or current, and resistance, and will further be able to measure these units with a multimeter.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
	Resistor assortment 12 V. power supply, multimeter, 12 V lamp and connecting wires. Electronic calculator Unit 3, Electricity by Gerrish, Goodheart-Wilcox Build a Course Series.	1. Define and explain the concepts of voltage current (amperes) and resistance	Listen Take notes
		2. Define the relationships between these concepts (Ohms Law) $I = \frac{E}{R}$ $E = I \times R$ and $R = \frac{E}{I}$	
		3. Connect a demonstration lamp circuit and demonstrate the measurement of volts, ohms, and amperes using the multimeter.	Observe

LESSON PLAN (CONTINUED): 7 UNIT NO. 18, 19 LESSON NO. PAGE 2 OF 3

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
		4. Verify that Ohm's Law describes the relationship between the variables. Note: Measured resistance will be low when the bulb is cold so determine hot resistance by measuring E and I and doing Ohm's Law 5. Define watts and introduce Watt's Law. $W = E \times I$ 6. Demonstrate calculation of wattage of the demonstration circuit. 7. Explain safety rules associated with use of the multimeter A. Set meter for proper function (volts, amps, resistance, AC, DC, etc. B. Make sure the range is big enough to handle the measurement	

LESSON PLAN (CONTINUED): 7 UNIT NO. 18, 19 LESSON NO. PAGE 3 OF 3

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	 STUDENTS
		C. Use proper connection (1) Amps - service (2) Volts - across or parallel (3) Ohms - across isolated component D. Polarity for DC + to +; - to -	
	Use overhead transparency, Page 84 of Electricity by Gerrish, et al.	8. Demonstrate how to interpret the scale	Observe
		9. Assign students to work math problems on top of Page 87, Electricity by Gerrish	Solve math problems using calculator
	Teacher designed assignment sheet	10. Assign students to connect a simple circuit using a power source and a resistor, and then verify a math analysis by meter reading	Complete lab exercise using multimeter

LESSON PLAN

7.J. Major Modes of Transportation
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 7 (NO.) LESSON: 20 (NO.) UNIT PERFORMANCE OBJECTIVE: 7.16;7.17 (CODE NO.) COMPETENCY VERIFICATION EV 7.11 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to describe the main principle of operation of major transportation systems and further identify advantages and disadvantages of each.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
	Detailed outline for lecture discussion guidance	1. See detailed outline - discuss the major types of land, sea, and aero-space transportation. Bringing out advantages, disadvantages and principles of operation.	Listen Contribute to discussion Take notes
		2. Announce plans for construction of model rocket or model glider for the next two days	Make plans for model construction

LESSON PLAN

7.K. Model Construction for Aero-Space Transportation
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 7 (NO.) LESSON: 21, 22 (NO.) UNIT PERFORMANCE OBJECTIVE: 7.17 (CODE NO.) COMPETENCY VERIFICATION EV 7.11 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to construct a model which will demonstrate principles of airplane or rocket flight.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
100	Activity 6-2. "Theory of Flight - Unpowered Gliders", Pages 111 to 114, or Activity 6-4 "Rocket Vehicles: Model Rocketry" Pages 123 to 128, in EXPLORING TECHNOLOGY ACTIVITY ACT MANUAL by Bame and Cummings, Davis Publications.	1. Select either a model rocket or a model glider for a demonstration project	
		2. Guide students in construction and trial flights	Construct model Fly and adjust

LESSON PLAN

7.L.1-7 Careers in Energy/Power/Transportation
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 7 (NO.) LESSON: 23,24 (NO.) UNIT PERFORMANCE OBJECTIVE: 7.18 (CODE NO.) COMPETENCY VERIFICATION EV 7.12 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to identify a career related to energy/power/transportation and describe its training requirements, major taks and responsibilities, working conditions and occupational outlook.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES	
		TEACHER	STUDENTS
20	Detailed unit outline	1. Ask the class to brainstorm career/job titles in the categories identified in the detailed outline of this unit. Record responses on the chalk board.	
5	*Dictionary of Occupational Titles* *Occupational Outlook Handbook*	2. Assign class members to select a career which they would feel personally able to fulfill and to gather data regarding the career to be included in a written report	
75		3. Assist individuals in decision making, data gathering and report writing as needed.	

LESSON PLAN

7.I-L Transportation Competency Verification
(TOPICAL OUTLINE CODE NO. AND TITLE)

PAGE 1 OF 1

UNIT: 7 (NO.) LESSON: 25 (NO.) UNIT PERFORMANCE OBJECTIVE: 7.9-7.17 (CODE NO.) COMPETENCY VERIFICATION EV 7.7-7.11 (EV CODE)

LESSON OBJECTIVE OR PURPOSE: Students will be able to verify competencies related to energy/power/transportation.

TIME (MIN.)	EQUIP., SUPPLIES RESOURCES	PRESENTATION AND LEARNING ACTIVITIES TEACHER	STUDENTS
		1. Review competencies to be verified	Listen Ask questions
		2. Administer tests	Respond to questions
		3. Review and clarify understanding	Ask questions

(EW 7.1)

NAME: ____________________ DATE: ____________ SCORE: ______

UPO 7.1

INSTRUCTIONS:

Answer the following statements using a true or false answer.

_____ 1. There are seven (7) simple machines

_____ 2. There are three (3) classes of levers

_____ 3. The incline plane is the basis for the screw

_____ 4. The combination of a rope and pulley is a type of simple machine

_____ 5. Work can be defined as force times the distance an object is moved

_____ 6. Kinetic energy is the energy of mass at rest

_____ 7. Torque has to do with force moving an object in a straight line

_____ 8. The human forearm is an example of a lever

_____ 9. One law of motion states that for every action there is an equal and opposite reaction

_____ 10. Friction is the resistance to motion between objects in contact

INSTRUCTIONS:

Using the blank to the left choose the correct letter that completes the statements

_____ 1. An axe head is an example of the

A. Lever
B. Incline plane
C. Pulley
D. Wedge

_____ 2. Momentum is:

A. Friction
B. Energy of mass in motion
C. Acceleration
D. Related only to applications of the pulley

_____ 3. Power is:

A. The capacity to do work
B. The time rate of doing work
C. A push or pull
D. None of the above

_____ 4. Power is equal to:

A. $\frac{\text{Force x Distance}}{\text{Time}}$

B. Mass x acceleration
C. Length x width
D. $R_1 + R_2 + R_3 + \ldots + RT$

_____ 5. Efficiency is the ratio between

A. Work and power
B. Effort in mechanical advantage
C. Input and output energies
D. None of the above

INSTRUCTIONS:

Fill in the blank spaces with the appropriate word, or words, for sentence completion or item identification

1. Torque can be defined as __________ x ____________

2. Energy at rest is called ______________ energy

3. Two main words used to describe the motion of an object are

__________________ and _________________

4. Mechanical advantage is the ratio of input force to _________

5. A crowbar is an example of a _________________

6. The mechanical advantage of a pulley system is dependent upon the ____________________________ supporting the load.

7. Friction can be reduced by the use of ______________

8. The laws of motion effect all objects. How many of these laws are there? ____________

(EW 7.2)

NAME: ______________________ DATE: __________ SCORE: _______

UPO 7.2; 7.3

INSTRUCTIONS:

Using a separate sheet of paper answer the following questions in complete sentences.

1. Explain how hydraulic (pneumatic) systems can increase mechanical force by describing the function or purpose of each of the component parts of the system.
   A. Describe the purpose of the drive piston.
   B. Describe the purpose of the driven piston.
   C. Describe the function of the hydraulic fluid.
   D. Explain the purposes of valves and pumps.
2. What is the purpose of an automobile hoist? How does it operate?
3. What main automobile safety system operates on the principle of hydraulics?
4. Earth moving equipment is essential to the construction industry. How are the principles of hydraulics involved in the function of this equipment?

9. The screw is a simple machine in itself. It is also an application of the modified ____________________

10. Acceleration is the change in speed of an object during a specified period of ___________________________.

(EV 7.3)

NAME: ______________________ DATE: __________ SCORE: ______

UPO 7.4

INSTRUCTIONS:

Using a separate sheet of paper, answer the following questions in complete sentences.

The sun is the source of all energy on earth. Explain the conversion of the sun's energy to the other more common forms utilized today such as:

1. Wind power
2. Water power
3. Solid wood fuel
4. Coal fuel
5. Petroleum fuel

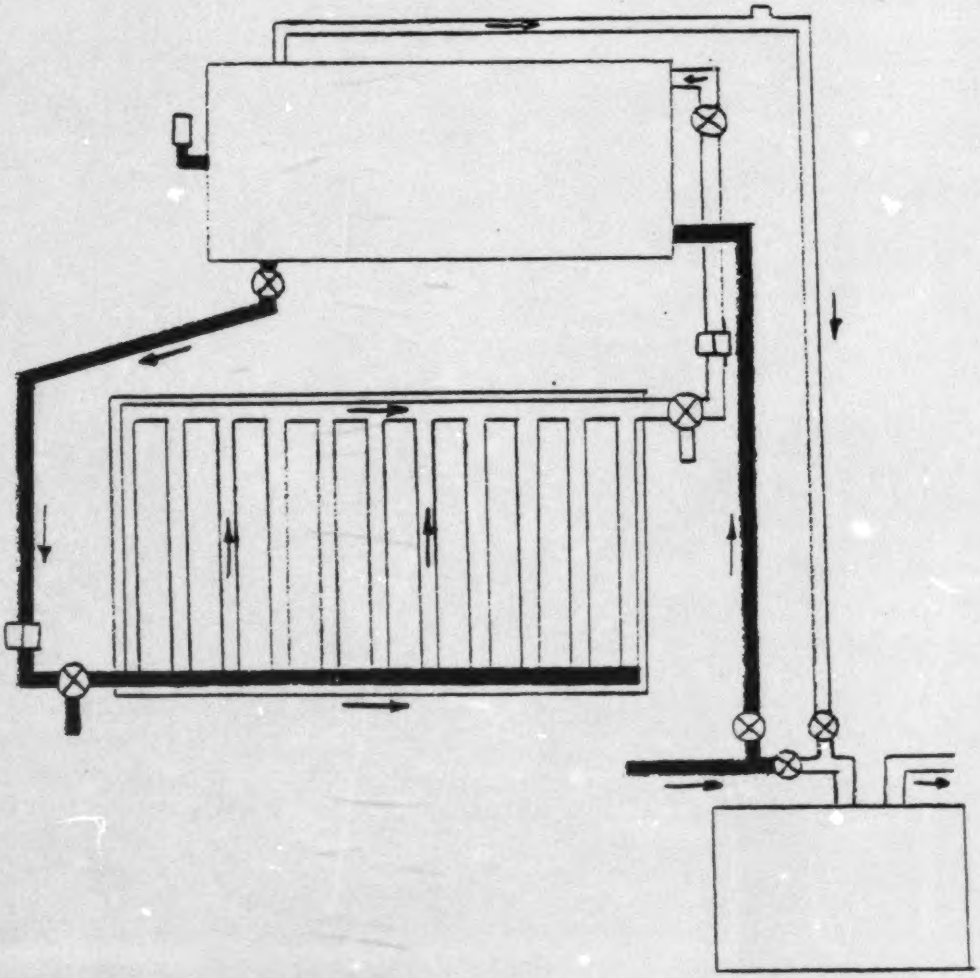
(EV. 7.4)

NAME: ______________________ DATE: __________ SCORE: ______

UPO 7.5

INSTRUCTIONS:

Using a separate sheet of paper, identify the function of the various parts of a passive solar hot water heater for domestic use.



NAME: ______________________ DATE: ________________ SCORE: ______

UPO 7.6; 7.7

INSTRUCTIONS:

Using a separate sheet of paper, answer the following questions in complete sentences.

1. Identify two (2) applications of wind power.
2. Describe the system used to harness wind power in each of the applications above.
3. A water based energy system has many components. Some of them are listed below. Identify the function of each of these components.

    A. Weather

    B. Streams and rivers

    C. Dams

    D. Water wheels and turbines

    E. Gates

    F. Electrical generators

(EV 7.6)

NAME: ____________________ DATE: __________ SCORE: ____

UPO 7.8

INSTRUCTIONS:

In the space provided answer the following questions in complete sentences.

1. Identify four (4) historical methods used to generate direct heat/light using chemical combustion.

2. When heating a home through the combustion of solid or liquid fuel certain safety considerations must be taken. Identify two (2).

   1.

   2.

3. Explain the purpose of a high temperature cut-off device on modern home furnaces.

4. When burning wood for heat, dampers are often required. Explain the function of a combustion air damper.

5. Explain why the traditional fireplace was a very inefficient heat source.

(EV 7.7)

NAME: ____________________ DATE: ________________ SCORE: ___

UPO 7.9

INSTRUCTIONS:

In the space to the left place the letter of the statement in the right column which identifies the item.

PART I.

_____ 1. Heat exchanger/boiler

_____ 2. Fire box

_____ 3. Lines and manifolds

_____ 4. Turbine

_____ 5. Condensor

_____ 6. Return pump

_____ 7. Generator

_____ 8. Governor

A. Device that pumps hot water under pressure back to the boiler

B. Device constructed of a series of blades which turn when steam flows through them

C. Where fuel burns to produce heat

D. Device used to convert mechanical energy to electrical energy

E. Device used to make engine rotate at constant speed

F. Devices used to conduct steam and/or water to various parts of the engine

G. Where steam returns to water

H. Where water absorbs heat and changes to steam

UPO 7.10
PART II.

_____ 1. Power

_____ 2. Exhaust

_____ 3. Intake

_____ 4. Compression

A. Piston stroke when both valves are closed as fuel mixture is compressed
B. Piston stroke after spark plugs fire igniting air fuel mixture
C. Piston stroke when gases are exhausted from cylinder
D. Piston stroke when air and fuel enters cylinder

UPO 7.11
PART III.

_____ 1. Spark plug

_____ 2. Cylinder

_____ 3. Piston

_____ 4. Connecting rod

_____ 5. Crankshaft

_____ 6. Valves (intake/ exhaust)

_____ 7. Firing chamber

_____ 8. Cam shaft

_____ 9. Carburetor

_____ 10. Ignition system

_____ 11. Lubrication system

A. That system which supplies oil to the moving parts
B. The chamber in which ignition takes place
C. The device in which the air and fuel is combined
D. The part that connects the piston with the crankshaft
E. Part of engine that causes the valves to open and close at the right times
F. The device that compresses air/ fuel mixture
G. Parts that allow the air/fuel mixture to enter and exhaust gases to leave the cylinder
H. Creates the electrical energy to fire the fuel mixture
I. Device that transmits mechanical power to outside loads
J. Part of the engine that guides piston travel and encloses engine gases
K. The device that fires the air/fuel mixture

(EV 7.8)

UPO 7.12

Small Internal Combustion Engine Service

Team Names: ______________________________

____

____

TASKS	TASKS COMPLETED	
	YES	NO
Change oil		
Change/clean spark plug		
Change/clean air filter		
Adjust idle speed		

REMARKS:

____

____

____

(EV 7.9)

NAME: ______________________ DATE: __________ SCORE: ____

UPO 7.13

HOME WORK ASSIGNMENT
COMMERCIAL ELECTRICAL POWER DISTRIBUTION

DIRECTIONS: Demonstrate your understanding of the commercial electrical power system serving your neighborhood by completing the chart below:

DEVICE	Location in your neighborhood, building or home	Purpose or function of device
Distribution panel (fuse or circuit breaker box)		
Entrance cable		
Meter		
Weatherhead of underground approach		
Lead in lines		
Step-down transformer		
High voltage lines		

NAME: ____________________ DATE: _______________ SCORE: _______

UPO 7.14

INSTRUCTIONS:

Using a separate sheet of paper answer the following questions in complete sentences.

1. Describe the purpose of a ground fault interrupter.
2. Identify one location within the home where a ground fault interrupter is recommended.
3. Why are circuit breakers and fuses used on electrical circuits?
4. Explain the dangers of kite flying as related to power lines.
5. When wiring in a light switch is it important that the switch is wired into the "hot" side of the line. Explain the importance.
6. Explain the purpose of double insulated portable power tools.
7. What is the standard first-aid treatment for victims of electrical shock.
8. Explain why automobile-power pole accidents are extremely hazardous.
9. Explain how and why an electrical fuse breaks a circuit that is overloaded.
10. When using a portable power tool, when is it necessary that it be grounded? Explain.

(EV 7.11)

NAME: ________________ DATE: ________________ SCORE: ______

UPO 7.15; 7.16

INSTRUCTIONS:

Using a separate sheet of paper answer the following questions in complete sentences.

PART I. Identify and explain one (1) advantage and one (1) disadvantage or problem in each of the following modes of transportation.

A. Railroads
B. Automobiles
C. Buses
D. Boats
E. Airplanes

PART II. Explain how weight is supported during the operation of the following types of vehicles

A. Airplanes
B. Railroads
C. Automobiles
D. Ships/boats
E. Space vehicles

PART III. Explain the basic propulsion system commonly used in each of the following types of vehicles.

A. Airplanes
B. Railroads
C. Automobiles
D. Ships/boats
E. Space vehicles

(EV 7.12)

NAME: ______________________________ DATE: ____________________

UPO 7.17

EVALUATION OF TERM PAPER/WRITTEN REPORT

	DONE VERY WELL	SATIS-FACTORY	MORE WORK NEEDED	NOT APPLI-cable
A. CONTENT				
1. Covered chosen subject thoroughly				
2. Major points well organized				
3. Purpose of paper made clear				
4. Conclusion or summary well thought out				
B. FORM/GRAMMAR				
1. Outline done according to accepted form				
2. Acceptable punctuation and spelling				
3. Sentences and paragraphing clear grammatical construction				
4. Quotation and citations done properly				
5. Footnotes done according to accepted form				
6. Bibliography done according to accepted form				
C. RESEARCH TECHNIQUE				
1. Good variety of source material				
2. Authorities given to substantiate opinions				
3. Paper shows writer has done ample reading on the subject				

SECTION IX

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